

Y4.Sci 2: 94-2/ww
94-2
[COMMITTEE PRINT]

INTERAGENCY COORDINATION OF
FEDERAL SCIENTIFIC RESEARCH AND
DEVELOPMENT: THE FEDERAL
COUNCIL FOR SCIENCE
AND TECHNOLOGY

REPORT

PREPARED FOR THE
SUBCOMMITTEE ON
DOMESTIC AND INTERNATIONAL
SCIENTIFIC PLANNING AND ANALYSIS
OF THE
COMMITTEE ON SCIENCE AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES
NINETY-FOURTH CONGRESS
SECOND SESSION

BY THE
SCIENCE POLICY RESEARCH DIVISION
CONGRESSIONAL RESEARCH SERVICE
LIBRARY OF CONGRESS

Serial WW



JULY 1976



Printed for the use of the Committee on Science and Technology

INTERAGENCY COORDINATION OF
FEDERAL SCIENTIFIC RESEARCH AND
DEVELOPMENT: THE FEDERAL
COUNCIL FOR SCIENCE
AND TECHNOLOGY

R E P O R T

PREPARED FOR THE
SUBCOMMITTEE ON
DOMESTIC AND INTERNATIONAL
SCIENTIFIC PLANNING AND ANALYSIS

OF THE
COMMITTEE ON SCIENCE AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES
NINETY-FOURTH CONGRESS
SECOND SESSION

BY THE
SCIENCE POLICY RESEARCH DIVISION
CONGRESSIONAL RESEARCH SERVICE
LIBRARY OF CONGRESS
Serial WW



JULY 1976

Printed for the use of the Committee on Science and Technology

U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON : 1976

73-526

COMMITTEE ON SCIENCE AND TECHNOLOGY

OLIN E. TEAGUE, Texas, *Chairman*

KEN HECHLER, West Virginia
THOMAS N. DOWNING, Virginia
DON FUQUA, Florida
JAMES W. SYMINGTON, Missouri
WALTER FLOWERS, Alabama
ROBERT A. ROE, New Jersey
MIKE McCORMACK, Washington
GEORGE E. BROWN, Jr., California
DALE MILFORD, Texas
RAY THORNTON, Arkansas
JAMES H. SCHEUER, New York
RICHARD L. OTTINGER, New York
HENRY A. WAXMAN, California
PHILIP H. HAYES, Indiana
TOM HARKIN, Iowa
JIM LLOYD, California
JEROME A. AMBRO, New York
CHRISTOPHER J. DODD, Connecticut
MICHAEL T. BLOIN, Iowa
TIM L. HALL, Illinois
ROBERT (BOB) KRUEGER, Texas
MARILYN LLOYD, Tennessee
JAMES T. BLANCHARD, Michigan
TIMOTHY E. WIRTH, Colorado

CHARLES A. MOSHER, Ohio
ALPHONZO BELL, California
JOHN JARMAN, Oklahoma
JOHN W. WYDLER, New York
LARRY WINN, Jr., Kansas
LOUIS FREY, Jr., Florida
BARRY M. GOLDWATER, Jr., California
MARVIN L. ESCH, Michigan
JOHN B. CONLAN, Arizona
GARY A. MYERS, Pennsylvania
DAVID F. EMERY, Maine
LARRY PRESSLER, South Dakota

JOHN L. SWIGERT, Jr., *Executive Director*
HAROLD A. GOULD, *Deputy Director*
PHILIP B. YEAGER, *Counsel*
FRANK R. HAMMILL, Jr., *Counsel*
JAMES E. WILSON, *Technical Consultant*
J. THOMAS RATCHFORD, *Science Consultant*
JOHN D. HOLMFELD, *Science Consultant*
RALPH N. READ, *Technical Consultant*
ROBERT C. KETCHAM, *Counsel*
REGINA A. DAVIS, *Chief Clerk*
MICHAEL A. SUPERATA, *Minority Counsel*

SUBCOMMITTEE ON DOMESTIC AND INTERNATIONAL SCIENTIFIC PLANNING AND ANALYSIS

RAY THORNTON, Arkansas, *Chairman*

ROBERT A. ROE, New Jersey
DALE MILFORD, Texas
JAMES H. SCHEUER, New York
HENRY A. WAXMAN, California
JEROME A. AMBRO, New York
JAMES J. BLANCHARD, Michigan

JOHN B. CONLAN, Arizona
JOHN JARMAN, Oklahoma
GARY A. MYERS, Pennsylvania

SUBCOMMITTEE STAFF

JOHN D. HOLMFELD, *Science Consultant*
DARCIA D. BRACKEN, *Science Consultant*
JAMES L. GALLAGHER, *Minority Technical Consultant*

LETTER OF TRANSMITTAL

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE AND TECHNOLOGY,
Washington, D.C., July 20, 1976.

HON. OLIN E. TEAGUE,
*Chairman, Committee on Science and Technology,
House of Representatives, Washington, D.C.*

DEAR MR. CHAIRMAN: I am glad to transmit to you a background study entitled: "Interagency Coordination of Federal Research and Development: The Federal Council for Science and Technology."

This study provides a thorough review of the principal unit within the Executive branch of the Government, apart from the budget office, with responsibility for the coordination of Federal research and development activities. The Study covers in detail the history of this Council from its establishment under President Eisenhower in 1959 to date. It also covers the earlier organizations established for this purpose as well as the establishment during this Congress by Public Law 94-282, of the successor organization, the Federal Coordinating Council for Science, Engineering, and Technology. Throughout this historical review, the study provides discussions of the questions of policy, results, and evaluation associated with the efforts needed to coordinate the research and development programs of our government.

We are indebted to Mrs Dorothy M. Bates of the Congressional Research Service for this excellent study. Mrs. Bates has performed a number of earlier studies in the field of science policy and science policy organization for our Committee and for other Committees of the Congress. The present study measures up to the high standards of completeness and thoroughness which characterizes the research work of Mrs. Bates, and we are fortunate to have available this volume. as we begin our Special Oversight hearings on this important subject

In the preparation of the study, Mrs. Bates had the assistance of Dr. Robert Morrison who wrote two of the case studies on specific Council Committees, Mr. John Justus who wrote the case study of another Council Committee, and Ms. Karen Guarisco who compiled the Presidential statements referring to the Council.

I believe this study will be of great value to our Subcommittee as we review the management of those Federal research and development activities which affect more than one department or agency. I commend it also to the attention of the Committee members and the members of the House as a valuable work in the field of science policy.

Sincerely yours,

RAY THORNTON, *Chairman,
Subcommittee on Domestic and International
Scientific Planning and Analysis.*



Digitized by the Internet Archive
in 2013

<http://archive.org/details/intecoord00libr>

LETTER OF SUBMITTAL

THE LIBRARY OF CONGRESS,
CONGRESSIONAL RESEARCH SERVICE,
Washington, D.C., July 15, 1975.

HON. RAY THORNTON,
*Chairman, Subcommittee on Domestic and International Scientific Plan-
ning and Analysis, Committee on Science and Technology, U.S.
House of Representatives, Washington, D.C.*

DEAR MR. CHAIRMAN: I am pleased to submit the enclosed report "Interagency Coordination of Federal Scientific Research and Development: The Federal Council for Science and Technology," prepared in response to your request to our Science Policy Research Division. The report covers the origin and history of the Federal Council, traces the evolution of its organization and operations, and concludes with a legislative history of Title IV of P.L. 94-282 which established the Federal Coordinating Council for Science, Engineering, and Technology.

The report was prepared by Mrs. Dorothy M. Bates, Specialist, Science and Technology, in consultation with Dr. Charles S. Sheldon II, Chief, and Mr. Walter Hahn, Assistant Chief, Science Policy Research Division. Dr. Robert E. Morrison, Specialist in Earth Science, is responsible for the case histories on the Interdepartmental Committee for Atmospheric Sciences and the Interagency Committee on Marine Science and Engineering. He also contributed a summary of the activity of the Interagency Task Force on Inadvertent Modification of the Stratosphere. Mr. John R. Justice, Analyst in Earth Science, wrote the case history of the Interagency Committee on Oceanography. Mrs. Karen Guarisco, Science Policy Analyst, compiled the Presidential statements referring to the Federal Council for Science and Technology, and assisted in other ways. We also wish to express our appreciation to the Federal Council for Science and Technology for making available certain information which was not in the public record concerning the period from 1970 onward.

We hope your Subcommittee will find the report helpful in your investigation of interagency coordination of Federal scientific and technical activities.

Sincerely yours,

NORMAN BECKMAN,
Acting Director.

CONTENTS

	Page
Letter of transmittal.....	iii
Letter of submittal.....	v
I. Introduction.....	1
II. A summary retrospective look and a look ahead.....	5
Summary of the report.....	5
Evaluations of the strengths and weaknesses of the Federal Council for Science and Technology.....	10
A look ahead: Questions for subcommittee consideration.....	30
Conclusion.....	38
III. Coordination of Federal scientific and technical activities before the establishment of the Federal Council for Science and Technology ..	41
Scientific coordinating bodies (1916-46).....	41
Recommendations for Federal scientific coordination after World War II.....	42
Kilgore Report.....	42
Bush Report.....	43
Steelman Report.....	45
Establishment of Interdepartmental Committee for Scientific Research and Development (ICSRD).....	46
Summary of ICSR D operations.....	49
Termination of the ICSR D.....	51
Evaluation of ICSR D.....	53
IV. The Federal Council for Science and Technology from its establishment until the creation of the Office of Science and Technology (1959-62) ..	57
Post-Sputnik activities to strengthen America's scientific and techni- cal capability.....	58
President's Science Advisory Committee recommends creation of a Federal Council for Science and Technology.....	59
Special Assistant for Science and Technology and President's Science Advisory Committee relationships.....	59
"Strengthening American Science".....	60
Dr. Killian's summary of the report.....	62
Implementation of the PSAC recommendation to establish a Federal Council for Science and Technology.....	64
Executive Order 10807.....	64
Sectional analysis of Executive Order 10807.....	65
Comparison of Executive Order 9912 with PSAC recommenda- tions and with Executive Order 10807.....	67
Interdepartmental Committee-Federal Council relationship.....	67
Differences between the PSAC recommendations and Executive Order 10807.....	70
Reconciliation with other executive orders.....	70
Clarification of Federal Council authority vis-a-vis Federal agencies.....	71
Amendment to Executive Order 10807.....	71
Executive Order 10807 is the basis for title IV of Public Law 94-282.....	71
Organization and operations of the Federal Council (1959-62).....	71
Advisory status of the Council.....	71
First published activities report on Federal Council in 1962.....	73
Membership.....	73
Attendance at Council meetings.....	75
Meetings.....	75
Staffing and funding.....	75
Recapitulation of FCST functions under Executive Order 10807 ..	76
Functions unchanged 1959-76.....	76

IV. The Federal Council for Science and Technology—Continued	
Organization and operations of the Federal Council—Continued	Page
Summary of activities, 1959–62	78
1. In kind and scope, Federal Council activities have been diverse and wide ranging	78
2. The Council has utilized several avenues through which to translate recommendations into action	88
3. The use of interagency committees has been a principal means for interagency program planning and coordination from the Council's inception	89
4. Direct Presidential assignments to the Federal Council constituted an important basis for action during the early years	90
5. Interagency coordination over wide subject areas is a continuing process	90
6. The Federal Council as a "tent"	91
Congressional pressure for executive branch science reorganization	91
"Science organization and the President's office"	92
The Kennedy administration	94
Reorganization Plan No. 2 of 1962 transmitted to the Congress	95
Federal Council role under Reorganization Plan No. 2 of 1962	96
Reorganization Plan No. 2 of 1962 goes into effect	97
V. The Federal Council for Science and Technology during the existence of the Office of Science and Technology (1962–73)	99
Current relevance of a study of the 1962–73 period	99
Establishment of the Office of Science and Technology	100
The Federal Council for Science and Technology during the Kennedy administration	102
President-science adviser relationships	102
Presidential statements concerning Federal Council activities	105
Summary statement on the Federal Council during the Kennedy administration	107
Interim report on activities during calendar year 1963	117
The Federal Council for Science and Technology during the Johnson administration (1963–69)	119
President-science adviser relationship	119
Federal Council role basically unchanged	120
Presidential statements concerning Federal Council activities	122
Summary of Federal Council operations, 1963–1968	125
Membership	125
Membership enlarged by amendment to Executive Order 10807	125
Staff	125
Executive Secretary	126
OST staff on committees	126
Federal Council meetings	126
Annual reports	127
Federal Council committees	127
Problems considered by the Federal Council, 1964–68	127
1964 activities	129
Long-range planning	129
1965 and 1966 activities	132
1967 activities	137
OECD review of national science policy in United States	138
FCST reaction to Library of Congress report on OST	139
1968 activities	142
Science advice in the last year of the Johnson administration	142
The Federal Council for Science and Technology in the Nixon administration until its transfer from the Executive Office of the President (1969–73)	144
Summary remarks concerning science advice and coordination in the Nixon administration, 1969–73	144–146
President-science adviser relationships	146
Dr. DuBridge as science adviser and Chairman of the Federal Council	146
Dr. David as science adviser and Chairman of the Federal Council	147

V. The Federal Council for Science and Technology—Continued	
The Federal Council for Science and Technology in the Nixon Administration—Continued	Page
President-Federal Council relationships.....	148
Summary of Federal Council operations, 1969-73.....	149
Membership and attendance.....	149
Meetings.....	149
Staffing.....	150
Committees.....	151
Reports.....	152
Problems considered by the Federal Council, 1969-72.....	155
1969 activities.....	155
1970 activities.....	156
1971 activities.....	157
1972 activities.....	157
Two brief case studies.....	158
Assisting State and local governments to make better use of science and technology.....	158
The new technological opportunities program (NTOP) and the President's message on science and technology.....	159
Rumors of reorganization, 1972-73.....	160
Reorganization Plan No. 1 of 1973 is sent to Congress.....	161
Transfer of the science advisory and coordinating functions to the National Science Foundation.....	164
VI. The Federal Council for Science and Technology after transfer to the National Science Foundation (1973-76).....	165
Transfer to the NSF.....	165
Science adviser-Federal Council relationships.....	166
Summary of Federal Council operations within NSF.....	167
Physical location within NSF.....	167
Staffing.....	167
Staffing of interagency committees.....	168
Creation of Operating Committee.....	168
Funding.....	169
Changes in Federal Council meetings.....	169
Attendance at Council meetings.....	170
Enlarging the Council membership.....	170
Descriptive summary of the Federal Council is published.....	171
Federal Council activity report.....	171
Federal Council actions regarding its interagency committees.....	171
Annual review of Committee and Council actions.....	171
New committees.....	172
Reports and recommendations of other Federal Council committees.....	175
Evolution of Federal Council committees, 1959-76.....	176
Selected Federal Council activities.....	180
More effective utilization of Federal laboratories.....	180
Government patent policy.....	181
Policy statements of the Federal Council.....	182
Report on the Federal R. & D. program for fiscal year 1976.....	183
VII. Legislative history of establishment of Federal Coordinating Council for Science, Engineering, and Technology.....	185
The Federal Council opposed having a statutory base in 1967.....	185
Amendment of Executive Order 10807.....	186
Consideration and actions in the 93d Congress.....	186
National Technology Resources Council proposed.....	186
National Science and Technology Resources Council proposed.....	187
Council on Science and Technology proposed.....	188
Federal Coordinating Committee for Science and Technology proposed.....	190
National Policy and Priorities for Science and Technology Act, 1974.....	194

VII. Legislative history of establishment of Federal Coordinating Council—Continued	Page
Science policy legislation in the 94th Congress-----	198
Action in the House-----	198
Administration decides to reestablish science advisory office----	199
House hearings on legislative proposals and passage of H.R. 10230.-----	199
Senate action on S. 32 and passage of H.R. 10230 amended-----	200
Federal Coordinating Group for Science, Engineering, and Technology-----	202
Conference report on H.R. 10230-----	203
Federal Coordinating Council for Science, Engineering, and Technology-----	204
Comparison of Title IV of P.L. 94-282 with Executive Order 10807 of 1959, as amended-----	206
Table 1.—Comparison of the recommendations of the Steelman report and the provisions of Executive Order 9912 which established the ICSRD-----	74
Table 2.—Science and technology in the White House special projects fund, fiscal years 1958-62-----	76
Table 3.—Federal Council committees and panels, groups, et cetera, 1959-63-----	118
Table 4.—Federal Council committees and panels, groups, 1959-68-----	128
Table 5.—Federal Council committees and panels, groups, 1959-73-----	153
Table 6.—Federal Council committees and panels, 1959-76-----	177
Table 7.—Members of current Federal Council committees-----	179
Figure 1.—Full circle-----	40
Figure 2.—White House Science Structure-----	102

APPENDICES

A. Statement by the President upon signing order establishing the Interdepartmental Committee for Scientific Research and Development, and Text of Executive Order 9912, December 24, 1947-----	215
B. Executive Order 10807, March 13, 1959, as amended by Executive Order 11381, November 8, 1967, establishing the Federal Council for Science and Technology-----	221
C. Executive Order 10521, March 17, 1954, as amended by Executive Order 10807, March 13, 1959, on administration of scientific research-----	227
D. Executive Order 11381, November 8, 1967, amending Executive Order 10807, March 13, 1959, relating to the Federal Council for Science and Technology-----	231
E. Letter to Dr. H. Guyford Stever from President Richard Nixon dated July 1, 1973, in which he designated Dr. Stever to be Chairman of the Federal Council for Science and Technology-----	235
F. Members and observers of the Federal Council for Science and Technology, May 1976-----	239
G. Chairmen, members, observers, and executive secretaries of the Federal Council for Science and Technology, from 1959 to May 1976--	245
H. Report on Federal Council for Science and Technology, June 1962----	257
I. Reports of the Federal Council for Science and Technology and its committees, 1959-76-----	267
J. Presidential statements referring to the Federal Council for Science and Technology. Compiled by Karen Guarisco-----	297
K. Policy statements of the Federal Council for Science and Technology--	329
L. The Interdepartmental Committee for Atmospheric Sciences: A case history. Prepared by Robert E. Morrison-----	381
M. The Interagency Committee on Oceanography: A case history. Prepared by John Justus-----	397
N. The Interagency Committee on Marine Science and Engineering: A case history. Prepared by Robert E. Morrison-----	415
O. Text of National Science and Technology Policy, Organization, and Priorities Act of 1976 (Public Law 94-282, May 11, 1976)-----	431

I. INTRODUCTION

The missions of the eleven departments and sixty independent agencies, boards, and commissions which comprise the executive branch and which report to the President of the United States are so broad that there is scarcely a governmental unit whose activities do not in part overlap those of one or several other agencies.¹ It has been aptly stated that wherever there is need for division of labor, there is need for coordination; the two are central to the understanding of the organization process.² As division of labor has intensified, a parallel need for coordination also has intensified.

What is meant by coordination? Much has been written about the subject and it has been variously defined. Haimann has defined coordination as "the conscious process of assembling and synchronizing differentiated activities so that they function harmoniously in the attainment of organization objectives."³ Mooney has defined coordination simply as "the orderly arrangement of group effort, to provide unity of action in the pursuit of a common purpose."⁴

"Coordination" is different from "cooperation." The latter refers to a disposition and willingness of people to help each other and work together. Coordination is an orchestrated effort to achieve a common objective. It is possible, but much more difficult, to achieve coordination without a cooperative attitude, if sufficient authority is available. Where coordination depends on voluntary compliance, its attainment is impossible without cooperation.

Within the Federal Government, a network of coordinating bodies has been established—some within agencies, some between or among agencies, some only of Government representatives, some both Government and public. These bodies deal with subjects as specific as protection of Federal employees from fire (Federal Fire Council), utilization of Federal library resources or facilities (Federal Library Committee), to such broad areas as international monetary and financial policies (National Advisory Council on International Monetary and Financial Policies) or to the entire subject of science and technology. This last area was the assigned focus of the Federal Council for Science and Technology, the subject of this report.

The Federal Council, the top-level coordinating body for science and technology, is on the eve of a metamorphosis. Upon the approval of the National Science and Technology Policy, Organization and Priorities Act of 1976 (P.L. 94-282), on May 11, 1976, the Federal Council for Science and Technology was technically abolished, and a

¹ The Federal Budget groups all Federal activity in 15 main functional categories: National defense; international affairs; general science, space, and technology; natural resources, environment, and energy; agriculture; commerce and transportation; community and regional development; education, training, employment, and social services; health; income security; veterans benefits and services; law enforcement and justice; general government; revenue sharing and general purpose fiscal assistance; interest; and undistributed offsetting receipts. See U.S. Office of Management and Budget, *The Budget of the United States Government, Fiscal Year 1977*, Washington, U.S. Govt. Print. Off., 1976, Part 5, pp. 54-166.

² Haimann, Theo and William G. Scott, *Management in the Modern Organization*, Boston, Houghton Mifflin Co., 2d ed. 1974, p. 124.

³ *Ibid.* p. 126.

⁴ James D. Mooney, *The Principles of Organization*, Rev. ed. New York, Harper and Row, 1974, p. 5.

new Federal Coordinating Council for Science, Engineering and Technology is being established. The statutory base of the new body is to a large extent drawn from Executive Order 10807 which established the Federal Council for Science and Technology in 1959. The Coordinating Council is expected to begin its new existence as a part of the Office of Science and Technology Policy being organized in the Executive Office of the President. As of mid-July 1976, the Director of this office, who will also be the Chairman of the Coordinating Council, had not been announced.*

The Federal Council for Science and Technology was an interagency body of Federal officials of policy rank from thirteen designated departments and agencies, and observers from additional Federal instrumentalities, which was established by Executive Order 10807, on March 13, 1959, to promote closer cooperation among Federal agencies in facilitating the resolution of common problems in science and technology, to promote a greater measure of coordination, and to improve the planning and management of Federal scientific and technical programs. The Council operated through periodic meetings to discuss issues of common concern in an effort to reach a consensus on agreed actions. The bulk of Council activity was carried on through the formation of interdepartmental committees to deal with specific problem issues spanning the responsibilities of several agencies. These committees, which in turn also included subcommittees and advisory panels on still more specific problems, were evolving bodies, established when an issue required multiagency attention, and modified, merged, transferred or disbanded when specific issues no longer required attention at the Federal Council level. Although not required, the President's Science Adviser was always designated the Chairman of the Federal Council.

From its establishment until mid-1973, the Federal Council for Science and Technology was located in the Executive Office of the President. During most of this time it was aligned with the Office of Science and Technology, which served as the channel from the Council to the Congress. From mid-1973 to the present, it was located in and received staff support from the National Science Foundation.

Through calendar year 1969, annual reports on Council activities were published, providing a limited amount of information. Since then, except for a brief report in the Council's Report on the Federal R&D Program, FY 1976, there have been no consolidated reports of activity published; the only information is that appearing in bits and pieces in scattered hearings, in response to direct questions, and in connection with the release of committee reports.

This report on the Federal Council for Science and Technology has been prepared at the request of the Subcommittee on Domestic and International Scientific Planning and Analysis of the House Committee on Science and Technology to provide background information for the Subcommittee's planned Special Oversight hearings on the role and functions of the Council. The Subcommittee's continued interest in the Federal Council is a follow-on to its 1975 Special Oversight hearings on the Annual Report on Federal Research and Development Program, Fiscal Year 1976.⁵

*On July 21, 1976, President Ford nominated Dr. H. Guyford Stever for this position.

⁵ U.S. Congress, House, Committee on Science and Technology, Subcommittee on Domestic and International Scientific Planning and Analysis, Annual Report on Federal Research and Development Program, Fiscal Year 1976; Special Oversight Hearing, 94th Congress 1st sess. June 3-5, July 10, 1975. Washington, U.S. Govt. Print. Off., 1975. 133 p.

A study of the Federal Council for Science and Technology divides naturally into five time periods:

What were the circumstances which led to the creation of the Federal Council in 1959?

How did the Council function in the 1959-1962 period until the establishment of the Office of Science and Technology?

How did the Council function during the existence of the Office of Science and Technology in the period 1962-1973?

How has the Council functioned since its transfer to the National Science Foundation in 1973?

What problems and issues can be identified with respect to its successor, the Federal Coordinating Council for Science, Engineering, and Technology in the future?

The intention will be to provide sufficient background information on each time period to show the evolution of the Federal Council, to highlight accomplishments and shortcomings, and in general to bring together as much information about the Council as is possible within a limited period of time. This review of the Federal Council over the last seventeen years may point up strengths and weaknesses of the interagency coordinating mechanism for science and technology which may be helpful in the development of the organization and operations of the new Federal Coordinating Council.

The principal sources of information for this study are materials in the public record. These have been supplemented with certain information made available by the Chairman of the Federal Council for Science and Technology and with interviews with a limited number of individuals who have first-hand knowledge of the Council and its operations.

II. A SUMMARY RETROSPECTIVE LOOK AND A LOOK AHEAD

This chapter has three purposes. One is to summarize briefly the content of each of the sections of this report on the Federal Council for Science and Technology. Following the section-by-section review is a compilation of evaluations of the Federal Council excerpted from the public record.

The third purpose is to look ahead to the new Federal Coordinating Council for Science, Engineering, and Technology which will be organized coterminous with the new Office of Science and Technology Policy in the Executive Office of the President, and by showing similarities in the charters of the old and new Councils, to raise certain questions which the subcommittee under Chairman Thornton may wish to explore during the forthcoming hearings and subsequently. These questions may in turn suggest additional questions.

SUMMARY OF THE REPORT

Section I

This section, the Introduction, places the Federal Council for Science and Technology within its proper context. It was the principal interagency coordinating body for science and technology in the Federal Government, functioning in an advisory capacity to the President and chaired by his science advisor, from its creation in 1959 to its technical abolition with the signing of the National Science and Technology Policy, Organization and Priorities Act of 1976. With the signing of this Act a new Federal Coordinating Council for Science, Engineering, and Technology was established which in many ways is markedly similar to the Council it replaced.

The subject of interagency coordination for science and technology is relevant to the oversight responsibilities of the Subcommittee on Domestic and International Scientific Planning and Analysis of the House Committee on Science and Technology, which has requested this historical review of the evolution of the Federal Council for Science and Technology. Five time periods are considered: Interagency coordinating bodies prior to the establishment of the Federal Council for Science and Technology; the Federal Council in the Office of the Special Assistant to the President for Science and Technology, from its establishment in 1959 until the establishment of the Office of Science and Technology in 1962; the Federal Council as part of the science advisory apparatus in the Executive Office of the President during the existence of the Office of Science and Technology, 1962-1973; the Federal Council after its transfer to the National Science Foundation following the abolition of the Office of Science and Technology in 1973, until the passage of the National Science and Technology Policy, Organization, and Priorities Act of 1976; and interagency coordination in the future with the return of a science advisory office to the Executive Office of the President.

Section II

A Summary Retrospective Look and a Look Ahead, is this Section.

Section III

The third section, Federal Scientific and Technical Coordination Before the Establishment of the Federal Council for Science and Technology, identifies Federal scientific coordinating bodies from World War I, through the World War II period. The purpose of this very brief review was to indicate that mechanisms for coordination of scientific activity were necessary even during a period when the Federal R&D budget was far less than it is today.

Recommendations for Federal scientific coordination after World War II in three important reports were reviewed next. These were: "The Government's Wartime Research and Development, 1940-44," report of the Subcommittee on War Mobilization of the Senate Committee on Military Affairs (the Kilgore Report); "Science, The Endless Frontier", report of the Committee on Science and the Public Welfare to Dr. Vannevar Bush (the Bush Report); and "Science and Public Policy," report of the President's Scientific Research Board (the Steelman Report).

The Steelman Report recommendation led to the establishment of the Interdepartmental Committee on Scientific Research and Development by President Harry Truman with the signing of Executive Order 9912 of December 24, 1947. The Interdepartmental Committee was the immediate predecessor of the Federal Council for Science and Technology, and functioned, although not at the policy level, until its abolition in 1959 by the Executive order which established the Federal Council. The Interdepartmental Committee's activities are reviewed, so far as they are known from the public record, as are the circumstances leading to the establishment of the Federal Council.

Section IV

The section, The Federal Council for Science and Technology from its Establishment until the Creation of the Office of Science and Technology (1959-1962), is a detailed account of the circumstances leading to the establishment of the Federal Council for Science and Technology. Its creation was a key recommendation of a December 1958 report of the President's Science Advisory Committee entitled "Strengthening American Science." In making public the report, President Dwight D. Eisenhower directed that the Federal Council be established. This was accomplished by Executive Order 10807 of March 13, 1959, which is discussed at length.

During this initial period the Federal Council activities were directed from the Office of the Special Assistant to the President for Science and Technology whom the President had designated as Chairman. Early and repeated invitations from congressional committees to the Chairman to testify regarding Federal Council actions as they affected the Federal departments and agencies for which Congress had oversight responsibility were refused because of the privileged position of the Council and Chairman as advisory to the President. Congressional investigations into the necessity for a Government-wide commission to look at the question of Federal organization for science and technology and a parallel investigation on how the Nation was organized for national policymaking for national

security, both under the Senate Government Operations Committee, sparked a decision by President John F. Kennedy to establish an Office of Science and Technology, which would be accountable to Congress.

It was not until after Reorganization Plan No. 2 of 1962 to establish the OST had been sent to the Congress that a report detailing the activities of the initial years of the Federal Council for Science and Technology was made public. From this report and other limited information, the organization and operations of the Federal Council for this early period are reviewed. Generalizations concerning aspects of Federal Council activities which have current relevance and a discussion of the events leading to the implementation of Reorganization Plan No. 2 of 1962 conclude this section.

Section V

The operation and activities of the Federal Council during the period it was aligned with the Office of Science and Technology, from July 1962 to July 1973, are reviewed in section V. The OST was headed by a Director, who was nominated by the President with the advice and consent of the Senate. Each Director (there were four during this period) was designated Special Assistant to the President for Science and Technology and served as Science Adviser to the President. Each Director was also elected Chairman of the President's Science Advisory Committee, which received its staff support from OST, and each was also designated Chairman of the Federal Council for Science and Technology. A Deputy Director and a small full-time professional and support staff, totalling at most about fifty, augmented by outside advisory panels, assisted the Director in carrying out these multiple responsibilities.

This period is reviewed under similar headings for each of the three Presidents—John F. Kennedy, Lyndon B. Johnson, and Richard M. Nixon—and the four science advisers who served them—Jerome B. Wiesner, Donald F. Hornig, Lee A. DuBridge, and Edward E. David, Jr. In the latter case, each of the two science advisors under Mr. Nixon is discussed separately. Since there was little public information available about the Federal Council during the 1970–1973 period, some material for this period was made available to the writer by the Federal Council for Science and Technology.

Over the eleven-year period during which OST was in existence, Presidential relationships to their science advisory units underwent a gradual deterioration, which the record attributed to a variety of factors. Among them were the changing times, emergence of new problems, differing Presidential attitudes toward science and technology and their place in public policy formulation, and differing Presidential relationships to their science advisors. Because it was a part of the OST complex, the Federal Council was affected by the changing Presidential relationships and attitudes toward their science advisory units. As the years went by, its accomplishments and those of its committees received decreasing public attention. This may have accounted, in part, for the increasing tendency to refer to the Council as an ineffective mechanism.

The concluding parts of Section V relate to Reorganization Plan No. 1 of 1973 which abolished the Office of Science and Technology, and transferred its functions to the Director of the National Science

Foundation. Congress permitted the plan to go into effect without opposition, although with misgivings, because it recognized the President's prerogative to organize his office as he saw fit.

In a separate Presidential letter, the NSF Director in his capacity as Science Advisor was designated Chairman of the Federal Council for Science and Technology which was transferred to the National Science Foundation and received staff support from the Science and Technology Policy Office.

Section VI

The section, the Federal Council for Science and Technology after Transfer to the National Science Foundation (1973-1976), summarizes operations and key activities of the Federal Council and its committees during the period it was in the National Science Foundation under the chairmanship of Dr. H. Guyford Stever from mid-1973 to June 1976. It is intended to be a point of departure from which to consider those aspects of the existing interagency coordinating structure that might be continued as well as those that might be modified in organizing the new Federal Coordinating Council for Science, Engineering, and Technology.

Details concerning the physical location of the Federal Council, its staffing, funding, and methods of operation are included to provide the reader with a mental picture of the organization as it presently exists. This picture includes a brief identification of each of the fourteen interagency committees and the task force which were in existence at the signing of P.L. 94-282. Two charts are included. One shows the evolution of interagency committees of the Federal Council throughout the 1959-1976 period; the other shows member and observer agencies of the current interagency committees. Case studies of three of the interagency committees—the Interdepartmental Committee for Atmospheric Sciences, Interagency Committee on Oceanography, and Interagency Committee on Marine Science and Engineering—are included in appendices L, M, and N.

Federal Council business during this period was to a large extent focused on the affairs of its interagency committees. This included annual reviews of the committees and consideration of their continuation as Federal Council committees, discussions of current activities and reviews of committee reports, and decisions concerning the establishment of new committees. These are summarized in this section.

Some of the subject areas considered by the Federal Council and its committee are also briefly described. Among them are the more effective utilization of Federal laboratories, Government patent policy, the report on the Federal R & D program for fiscal year 1976, and an interesting and important cooperative effort between the Federal Council for Science and Technology and the Council on Environmental Quality on the subject of fluorocarbons and the environment.

This summary is admittedly incomplete. When the Activities Report which the Federal Council decided late in 1975 to have prepared is made public, additional information concerning the Council will be generally available.

Section VII

The final section, Legislative History of Statutory Authority for the Federal Coordinating Council for Science, Engineering, and Technology, is a legislative history of Title IV of the National Science and

Technology Policy, Organization, and Priorities Act of 1976, which provides a statutory basis for the Federal Coordinating Council for Science, Engineering, and Technology. The idea of strengthening the Federal Council by legislation originated in the consideration of S. 2495, the Technology Resources Survey and Applications Act, in the Ninety-third Congress. As introduced in September 1973, this bill would have created a Cabinet-level Council to address important problems involving the utilization of high technology. The Council would be supported through an Office of Technology Applications to be established in NASA. Between introduction and reporting, S. 2495 was the subject of two series of hearings and underwent three major modifications. A second version proposed a National Science and Technology Resources Council with the Federal Council members as a nucleus. A third version assigned functions previously proposed for the Resources Council to a Council on Science and Technology, structured along the lines of the previous Office of Science and Technology, and omitted mention of the Federal Council. Finally, in the version jointly reported in September 1974, a new section was included which provided for the establishment of a Federal Coordinating Committee for Science and Technology as part of the Executive Office science advisory structure.

In October 1974, the Senate Committee on Labor and Public Welfare held hearings on S. 32, and two other bills, S. 2495 and S. 1686; shortly thereafter S. 32 amended was reported and passed containing the section providing for the establishment of a Federal Coordinating Committee for Science and Technology from S. 2495.

S. 32 was referred to the House Committee on Science and Astronautics which was engaged in a parallel inquiry of Federal policy, plans, and organization for science and technology. No further action was taken in the 93rd Congress.

In the 94th Congress, the House Committee on Science and Technology held extensive hearings on draft legislation which evolved into H.R. 10230 which the Committee reported in late October and the House passed on November 6, 1975. The House bill considered inter-agency coordination as a function of the Director of the Office of Science and Technology Policy but did not consider changing the authority under which the Federal Council for Science and Technology functioned. The Administration endorsed H.R. 10230 and urged its early approval.

Joint hearings were held on S. 32, which was identical to S. 32 of the 93d Congress, in late October and early November 1975 by the committees on Labor and Public Welfare, Aeronautical and Space Sciences, and Commerce. In the ensuing months, S. 32 underwent further revisions before an agreed version was reported on February 3, 1976. The following day, the Senate considered S. 32 and H.R. 10230 and passed the latter bill after amending it to contain the text of S. 32. H.R. 10230 went to conference February 26, 1976. On April 26, 1976, a conference report was filed, which the Senate agreed to the same day and the House followed suit on April 29. The House accepted Title IV of the Senate-passed version of H.R. 10230 which established the Federal Coordinating Council for Science, Engineering, and Technology with only minor changes, stressing the advisory nature of the Council in the sectional analysis. President Ford signed the Act on May 11, 1976.

The section concludes with a comparison of the text of Executive Order 10807 of 1959 with the text of title IV of P.L. 94-282.

EVALUATIONS OF THE STRENGTHS AND WEAKNESSES OF THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

It is beyond the scope of this report to evaluate the performance of the Federal Council and arrive at an independent judgment of its effectiveness. However, over the years many informed persons have discussed the Federal Council in broad terms. This section is a collection of these opinions. The items are presented in chronological order.

(A) U.S. Congress. House. Select Committee on Government Research. National goals and policies. Study number X. Report of the Select Committee on Government Research. 88th Congress 2d session. Washington, U.S. Govt. Print. Off., 1964. House Report No. 1941. 64 p. At pp. 35-37.

* * * *

CHAPTER V

CROSS AGENCY RESEARCH AND DEVELOPMENT POLICY FORMULATION

Another study of this committee discusses certain aspects of interagency research and development coordination.¹ Here we are concerned with questions of research and development policy which should be formulated across agency lines.

Individual departments and agencies have been delegated the dominant role in recommending and carrying out Government research programs, but there are many areas in which coordination of these activities by means of a cohesive Government-wide policy apparatus would yield significant benefits. The line authority for such coordination within the Executive rests solely with the President's Office and appears to be implemented primarily through decisions made during the budgeting process. If that is so, the Bureau of the Budget is the President's principal vehicle in coordinating many aspects of policy across agency lines. In recent years the Bureau has been assisted in its science policy roles by the Special Assistant to the President for Science and Technology and by the Office of Science and Technology. This small staff group—which also serves the President's Science Advisory Committee and the Federal Council for Science and Technology—tries to anticipate problems, makes special analyses, serves as a medium of communication with Congress on the subject, and tries to encourage the formulation of specific agency policies and longer term plans. It has already proved of assistance to the Bureau of the Budget in assessing agency and interagency technical programs and in time may be a major factor in strengthening research and development policy coordination during the budgetary process.

¹ Study No. VIII.

Certain mechanisms have evolved within the executive to facilitate more active interagency cooperation. Since the Government's present philosophy places dominant operating responsibility on the individual departments and agencies, coordination has normally had to be attained through mediation and consensus rather than by executive direction.

Federal Council for Science and Technology

The key operating mechanism for obtaining such cooperation is the Federal Council for Science and Technology (see ch. III).

Not all Federal research and development programs are coordinated by the Council. Nor has it built a comprehensive committee system based on any carefully studied list of needs. Instead its committee structure has been devised to meet certain types of issues.

In substantive programs, the Council has formed committees on oceanography, atmospheric sciences, materials research and development, high-energy physics, and natural resources, water-resources research, and behavioral sciences.

In program management, panels were appointed on scientific personnel, on patent policy, on contractor evaluation, the standing committee whose function [will be] described later, and committees on long-range planning and science information.

The development of Government-wide policies considering interactions beyond the Federal Establishment are reflected in an international committee and a panel on university relationships with Federal research facilities.

The standing committee prescribed by the Executive order and composed of scientists-administrators in the Federal service is concerned primarily with in-house management issues, and serves as a new medium of communication to all the Federal laboratory heads and to R. & D. administrative officials.²

Staff assistance for the Council is provided by the Office of Science and Technology and the agencies' staffs upon request. It can obtain additional advice from the National Academy of Sciences, and the President's Science Advisory Committee (of nongovernment science and technical leaders).

No single organization can hope to cure all the ailments of interagency cooperation. This would be just as true for a proposed Department of Science which would divorce all research and development activities from the mission-oriented agencies, while presumably trying to meet all their diverse needs. Second, the system is still developing and has not had sufficient time or support to realize its full potential.

Nevertheless the Council and its affiliated groups have promoted a new, less parochial perspective in the agencies. The problems uniting the Council's members—who represent the eight departments and agencies most intimately concerned—appear at least as great as those that divide them.

² Federal Council for Science and Technology, annual report, January 1963.

And they are realizing that a more concerted attack on certain problems may not only yield greater benefits than a more fractioned approach but may—in some cases—be the only realistic approach. This has been especially true in regard to certain technical programs of great national interest, but not of prime concern to a specific agency. In these cases the Council tries to proceed with a five-step program:

- (1) Finding out what each agency is doing in the program area and deriving consistent definitions and data for all agencies' activities.

- (2) Developing common goals toward which all the program's policies and plans should be directed.

- (3) Obtaining communication among the agencies of their future plans in budgetary and substantive terms.

- (4) Developing Government-wide objectives against which to compare the aggregate of agency plans and collectively agreeing to fill gaps, eliminate duplications, and jointly use specialized facilities.

- (5) In some cases, agreeing to assign or reassign major projects to achieve total effectiveness.

Unfortunately, but not surprisingly, the Council has not been able to complete all five steps for many of the programs it is trying to coordinate. While its committees vary in maturity, vigor, and effectiveness, the Council does provide a viable structure and concept for certain cross-agency program coordination. But it faces many problems in carrying out its role. It has been difficult to recruit and support a qualified staff of the necessary scope and depth to carry out its activities. The Council has found it difficult to introduce new projects or technical approaches essential to its broad programs, but outside the jurisdiction or historical interest of any one agency.

In addition to coordinating substantive aspects of cross-agency programs, the Federal Council also is concerned with certain aspects of Government-wide research and development management. The autonomy of the agencies has often led to widely different policies toward such things as: contract support, contractor evaluation, basic research support, cost allowability, ownership of research and development results, in-house research, use of advisory committees, and information exchange. But it needs the broader level support of Congress to eliminate useless or harmful inconsistencies among the individual agency policies. It bears repeating that Congress presently has no single group which can serve as a focal point for legislative support on such policy matters.

Below the level of the Office of Science and Technology and the Federal Council there are many other examples of cooperative relationships in the executive branch. These range from informal contacts between the scientists and engineers to formal contract commitments between agencies. Such cooperation tends to occur easily and naturally for aspects of research and development clearly related to each agency's dominant mission. Difficulties most frequently occur in coordinating mission-oriented work when the mis-

sions of agencies overlap and they tend to compete within the fields of overlap.

In some cases the Bureau of the Budget is experimenting with assigning leadership responsibility for certain cross-agency programs to a single agency which has the prime interest in some aspect of the field. That agency is held responsible for seeing that a cohesive plan exists to integrate the necessary technical work of all agencies involved and to exploit the program's results. Participation on coordinating committees and panels entails extra work for already busy people who regard their primary rewards as stemming from their direct contributions to their parent agencies, rather than from interagency services. Consequently Congress must stimulate a cooperative agency management climate by seeing that such activities receive adequate attention, prestige, and reward. If Congress does not give adequate weight to such coordinate activities in its review and oversight functions, they will eventually wither away or be performed inadequately.

(B) Beckler, David. Strategic Federal decision-making on R&D. Research management, v. 9, September 1966: 319-333. At pp. 330-331. [Mr. Beckler was associated with the White House staff concerned with science and technology from 1954 until 1973.]

Mr. Beckler identified eight categories of scientific and technical functions that need to be performed at the Presidential level: policy development, resource allocation, science organization, program evaluation, program coordination, policy and program initiation, international scientific affairs, and technical leadership. His remarks on program coordination have been extracted below:

* * *

A fifth function, that is largely undertaken by the Federal Council for Science and Technology, concerns the coordination of agency research and development programs. If one examines the so-called national program in oceanography, one will find components of research programs of some 20 different agencies. It is a composite of agency programs. How these components relate, one to the other, whether there are overlaps or gaps, whether the total adds up to a well-balanced and forward-looking national oceanographic program is a responsibility of the Federal Council for Science and Technology through its Interagency Committee on Oceanography. The same need for program coordination is expressed in other Federal Council committees, such as atmospheric sciences, water resources research, high energy accelerator physics, materials research, and scientific and technical information. Aside from the coordination of research and development programs, the Federal Council is concerned with the development of common, forward-looking policies for Federal employment of scientific and technical manpower as well as policies for the support of research at academic institutions.

Thus, the Federal Council serves as a common forum for discussion among representatives of the major R&D agencies. Although coordination by the Federal Council is an indispensable management tool for harmonizing the research and development programs of the several agencies, it works best when there is a pre-existing consensus among the agencies. Such a consensus may not at times represent the best allocation of effort or the best conceived national research effort in the area, and it must often be subjected to additional scrutiny. The Council can recommend but cannot directly establish overall levels or division of effort since the actual resource allocation takes place in competition with other resource needs within each of the member agencies. However, it can be self-implementing when agreements are reached. Its views are taken into consideration by the Bureau of the Budget in the development of the President's annual budget.

(C) Brooks, Harvey. The Federal establishment for science and technology: Contribution to new national goals. *In* U.S. Congress. Senate. Committee on Government Operations. Research in the service of man: biomedical knowledge, development, and use. A conference sponsored by the Subcommittee on Government Research and the Frontiers of Science Foundation of Oklahoma, October 24-27, 1966. Washington, U.S. Govt. Print. Off., 1967. 246 p. [At head of title: 90th Congress 1st session. Committee print.] At pp. 60-62.

* * * The scientific interdependence of agencies greatly increases the need for horizontal communication between agencies at several levels and for cooperative development of broad scientific and technological capabilities. And when I speak of communication I mean not only exchange of information but mutual influence on each other's programs and priorities.

The Federal Government has responded in two rather different ways to the built-in conflict between the principle of agency responsibility and the needs of horizontal communication within technical disciplines across agency lines. Each has its strengths and difficulties.

The first formal method is that of the interagency coordinating committee, usually, but not always, under the aegis of the Federal Council for Science and Technology. Such committees have been established for oceanography, for atmospheric sciences, for water resources, for science information, for high-energy physics, for materials, and for a number of other areas in which several agencies have a major interest or in which the Government as a whole has a stake transcending individual agency responsibilities. There are also several agencies outside the Federal Council structure—the Space Council and the Oceanography Council, for example. Such committees are what their name implies—coordinating committees—because they do not in practice dilute the responsibility of individual agencies for their piece of the overall program. On the other hand, coordinating committees can only operate effectively by consensus. They can enforce

their views on agencies only by persuasion, not by direction. They cannot greatly influence an agency's own interpretation of its mission, and they find it difficult to focus attention on problems which are of vital concern to the whole scientific effort of the Government, but are not of demonstrably vital concern to any one agency. They work effectively only when there is no fundamental conflict between the priorities assessed by the interagency committee and the priorities as viewed by the component agencies. They cannot reallocate and coordinate effort within general categories or alter the fundamental division of responsibilities or budgets between agencies. Also, they find it increasingly difficult to operate effectively as the component pieces of their program become a larger—and hence more visible—fraction of the individual agency programs. The larger such a piece becomes the more likely it is to come into basic conflict with the priorities of the responsible agency, especially in periods of tight budgets. This piece of the program thus becomes increasingly unstable with respect to annual budget fluctuations.

The big advantage of the interagency program is that it tends to guarantee responsiveness to genuine mission needs within each agency. Its disadvantage is that it tends to neglect opportunities and needs which appear to lie outside the scope of any one agency. The alternative approach, which has been used in the case of atomic energy and space, is to create a new agency to deal with a new technology as it emerges. This approach has the big advantage of allowing for a more comprehensive and coherent approach to a whole technological area. It provides an excellent mechanism for nurturing such a technological area when its practitioners are too few in number and too obscure in the Government hierarchy to support and defend the new technology against competing requirements in the agencies. It is somewhat doubtful whether the various peaceful applications of nuclear energy could have been developed without being nurtured through their early stage by an agency which was specifically charged with exploiting nuclear energy in all its ramifications without limitation to particular fields of science or particular agency missions. In a sense the AEC was given a license to operate in the field of all the other agencies and of private industry, provided only its activities were interrelated among themselves by the common theme of nuclear phenomena. Thus we had an agency which was developed around a technological theme rather than a social mission. It could and did enter the areas of biology, agriculture, metallurgy, meteorology, civil engineering, energy production, ship propulsion, space propulsion, and waste management. It developed capabilities and promoted skills which touched on almost every aspect of American society.

The difficulty with the technological theme approach is that, once it is successful, there are few tools by which the theme can be kept in proper relationship with the various social goals which it serves. The continued development of the technology tends to become an end in itself to be pursued

as a national goal in its own right. This is all very well when the technological goal is a small part of the national effort, and when it is pursued on a small scale in Federal laboratories and universities. But when it becomes a major national effort, then the problem of balancing with other social goals becomes acute. What is lacking, of course, is a feedback mechanism which provides a measure of how much is enough. The President and the Congress, for example, find it very difficult to obtain a really objective assessment of the relative benefits to be achieved through investment in nuclear power as compared with the development of hydroelectric resources or improvements in coal technology. It is similarly difficult to get a clear picture of the relative emphasis which should be placed on water desalting in comparison with, say, reprocessing of waste waters or large scale water importation. The expertise in the various technologies involved tends to be unevenly represented in the decisionmaking process, and there is no automatic mechanism like the market to redirect effort into the most effective or promising channels. Except possibly in the Defense Department, there is no place in the Federal structure where the President or the Congress can go to obtain a disinterested and systematic exposition of alternatives for applied research and development programs. In principle this can be done by the staffs of the executive office agencies, the Bureau of the Budget, and the Office of Science and Technology, but in practice these are forced to rely heavily on the analyses and arguments prepared in the agencies themselves. Furthermore, we have not as yet developed the techniques that would make such analyses possible on a sufficiently convincing and objective basis to command acceptance by the affected agencies and institutions.

In many ways the case of biomedical research has developed in a way which is intermediate between that of the technological theme and the social mission. On the one hand, the NIH has developed into an agency which is very broadly based in the life sciences, or—if you prefer—biomedical technologies. In this sense it has come to mean for the biomedical sciences what the AEC has meant for atomic energy or NASA for space science and technology. On the other hand, it is organized by disease categories, and the allocation of its resources tends to be more in terms of the perceived social importance of certain diseases rather than in terms of the opportunities for technological progress in the application of biomedical techniques regardless of disease. It is thus an interesting hybrid between the highly product-oriented research of Agriculture and the highly technology-oriented research of AEC. The small feedback loops by which NIH controls its program are rooted in scientific criteria, but the large feedback loops which govern its budget and its broad allocations are primarily governed by the disease categories and health problems, and what is perceived as their social importance. This hybrid system has on the whole been remarkably effective.

There is no really satisfactory resolution of the issue of interagency coordination versus technological agencies. Probably the creation of a new agency becomes inevitable when support of a new technology reaches a sufficient fraction of the budget of existing agencies, or when the new technology is sufficiently revolutionary or has sufficiently broad potential ramifications. Certainly the breadth of application of the technology is an important criterion for the formation of a new agency. The technology orientation and the social orientation represent different cuts of the same complex of problems, and if we organize along one dimension we inevitably require coordination along the other.

(D) U.S. Library of Congress. Legislative Reference Service. The Office of Science and Technology. A report prepared by the Science Policy Research Division of the * * * for the Military Operations Subcommittee of the House Committee on Government Operations. Washington, U.S. Govt. Print. Off., March 1967. 326 p. [At head of title: 90th Congress, 1st session. Committee print.] At pp. 25-7.

COORDINATION, EVALUATION, AND PROGRAM LEADERSHIP

The political and scientific setting of Federal support for research and development poses two sets of problems. The first concerns intrinsic qualities of science and technology; the rapidly increasing complexity of scientific knowledge and sophistication of engineering developments; the blurring of traditional lines between disciplines; the importance of converting scientific results promptly and effectively to meet civilian problems; and the need to develop entirely new management concepts both in the support of sciences and in the development of weapon and space hardware systems. The second set of problems concerns the responsiveness and versatility of Government organization to meet newly evolving requirements. These difficulties are further intensified because fields of science and engineering do not correspond at all with Government departments. Rather than departments of physics, biology, or mechanical engineering, the Federal departmental structure is organized by tasks and missions that directly reflect the diversity of the Government's social, political, and economic objectives.

Federal departmentalism tends to foster the independent formulation by each component of policies and programs unrelated to those of its coequals. In the application of science and technology to achieve its statutory mission, each agency draws upon the entire pool of scientific information and resources that cut across all organizational boundaries. Without integration at the Presidential level, agencies could very well adopt policies for science and technology in direct contradiction to those of other agencies, could compete harmfully with each other for scarce manpower, and could unwittingly undertake programs that might either duplicate or leave gaps in the fulfillment of national objectives.

The authority, missions and roles and responsibilities of individual departments constitute the predominant basis for accomplishment of Federal research and development programs. Each department, with its own special and complex requirements, sponsors imaginative and creative research if its development programs are not to become sterile. Some diversity in administrative style must also be expected. To insist that Government processes in all agencies be identical for the sake of administrative tidiness might seriously damage the effectiveness of the R. & D. operation. Nevertheless, a continuing process is required which facilitates integration of individual agency efforts under common policies, internally consistent and coordinated in execution.

In serving the President, the OST has this responsibility. If one thinks literally of a "fabric" of science and technology in Government, the strong vertical lines of authority and responsibility which lead from the President to a department head would represent the "warp" of that fabric. The horizontal lines of the OST provide the "woof." In the main, OST has chosen the Executive order-based Federal Council for Science and Technology as its coordinating agent.

In an environment of departmentalism the Council must operate to gain consensus. By and large, its techniques, applied in the context of commonly developed fact, reflect the role of mediation and persuasion rather than executive direction. Both in substance and in its desire to meet common problems by joint action, this mode of Council operation has been facilitated by steps beginning in 1961 with impetus by the President's science adviser to establish posts for a policy level official in every agency that would be concerned with science and technology. By such action there would be present at points of policy decisionmaking the requisite scientific and engineering competence, familiar with Government and with senior responsibilities. These benefits also flow into all of the scientific and technical activities of the agencies, while adding strength to the Council itself.

Not all Federal science and technology is coordinated by the Council. And it cannot be said that there is a comprehensive interlocking committee system built upon a carefully studied set of needs. Some committees have continuing responsibilities; others are ad hoc. The Council has even encountered the unusual experience in Government of having one of its committees recommend its own dissolution. In one sense, there is a deliberate attempt to keep the number of committees to manageable proportions and thus not drown in efforts to coordinate coordinators.

In appraising coordination, it is possible to construct a scale of effectiveness, with different degrees or kinds of activity.

The obvious, but not necessarily prevailing, starting point in such a scale is the interagency exchange of information on current plans. This process may find expression through an inventory of on-going work, followed by an analysis of possible duplication or gaps, and thence the quality of program content.

Next comes the development and understanding of common goals toward which Government-wide policy and program planning should be directed. Related to this activity is the preparation of staff studies setting forth policy alternatives together with an evaluation of their consequences.

Third is the communication among agencies of their future plans. Such activity assumes meaning only if these plans are expressed in substantive as well as budgetary terms.

Fourth in this effectiveness index of interagency coordination is mutual planning ahead and planning together—the development of Government-wide objectives; the comparison of these targets with the aggregate of individual agency plans; collective agreements to fill gaps or eliminate duplication; and finally, the joint use of specialized facilities.

The fifth and highest level of Council activities lies in assignment or reassignment of programs to optimize effectiveness of the total effort. This may involve transfer of functions or of funds, or generation of proposals to modify legislative authority.

A review of the different subject areas selected by OST or Federal Council for coordination reveals a high variability in level of activity, and in continuity. Many Council committees reflect accomplishment only at the first step of information exchange. Even with the Council's Interagency Committee on Oceanography, which gained conspicuous accolades as the Council's showcase of coordination, the resolution of issues as to priorities for objectives and program components seemed realized but seldom. Few policy proposals originated in the ICO. Because the Congress felt oceanography deserved consistent and accelerated support, but found it crossed agency lines and had no agency functioning as delegated agent, remedial action was taken in the 89th Congress through legislation—by establishing the new Marine Sciences Council at a Cabinet level.

This step reflects congressional appreciation of the intrinsic difficulty of interagency coordination, and a responsiveness to problems of coordinating multiagency programs where participants lack operating momentum as compared to coordination of rival agencies that demonstrate vigorous initiatives. Formation of such a special council illustrates one administrative device to produce the major impact needed to start a program or to change direction of an existing one. Bringing together the collective wisdom and power of high-ranging officials for a limited time to accelerate a field to a size and momentum that is self-sustaining may be increasingly necessary at the level of the Executive Office of the President.

Congressional action also reflected concern that oceanographic planning and coordination was based only on an Executive order and lacked statutory underpinning. It was thus subject to uncertainties in Presidential priorities that could shift violently with changes in administration, especially with changes in party.

The present concept of governmental structure places the operating responsibility squarely in the hands of line agencies. But where functions are no longer clearly separated by agency boundaries, there is an increasing need for close lateral relationships. In this context coordination need not imply dictation from the top. It may, however, reflect two significant requisites of effective Government process—the preparation of Government-wide plans on the basis of which each agency's programs may be made compatible with the broader framework, and an oversight mechanism for self-analysis of defects in programs requiring a Government-wide approach.

A question thus arises as to whether the Federal Council mechanism as a science subcabinet should be made a statutory arm of OST. Under these circumstances, the same man might serve as Chairman, but as the OST Director rather than the President's special assistant. Members of the Council could then be held more accountable by the Congress for Government-wide planning than now when the Council is convened only by Executive order. This action would also resolve ambiguity between the Federal Council and OST functions.

(E) U.S. Office of Science and Technology. Federal Council for Science and Technology; 1967 annual report. Washington, U.S. Govt. Print. Off., 1968. 43 p. At pp. 13-14.

Functions of the Council

The Science Policy Research Division of the Legislative Reference Service of the Library of Congress prepared an interesting report, *The Office of Science and Technology*, which served as a basis for review of the functions of the Federal Council for Science and Technology by its members.

The members of the Council agreed that the structure and authority of FCST are satisfactory, and that a legislative base for FCST is not only unnecessary but undesirable because FCST is an instrument devised for the President to use as he sees fit in the administration of the laws. Problems in making FCST more effective arise from administrative sources and not from the nature of its formal authority.

The primary questions turn around what FCST is for and how it is used. A number of members expressed a preference for more general, more important and more thought-provoking discussion by FCST, as contrasted with managerial and administrative matters. In this connection, the members felt that FCST could have a more effective voice in determination of policy matters if it were presented with more analyses of policy for final discussion, modification and ratification. The special tasks, interests and preoccupations of the agencies made it difficult for them to generate policy, but FCST is a good group for assessing the implications of and practical problems associated with policy proposals.

There was some feeling that FCST could be used more effectively to deal with common problems and issues, as con-

trusted with those having to do with the division of tasks among agencies. Planning for the post-Vietnam period as a general problem faced by all agencies was cited as a case in point.

There was a consensus on the point that the central job of both FCST and PSAC—in different ways—is to help the President's Special Assistant for Science and Technology do the best possible job for the President. In this connection, PSAC is considered as providing an important link between the scientific, academic and foundation communities and the Federal agencies. The members thought that the central criterion for assessing FCST is whether the Special Assistant feels that FCST is meeting his needs.

The communication which FCST provides among the Federal agencies is considered important, as is provision of a central point of appeal by FCST committees, and a point for ratification and activation of their recommendations.

FCST is considered as particularly useful by smaller agencies and by those in which science and technology are a small part of the total mission and are thereby somewhat subordinated.

The Chairman summarized his reaction to the discussion as follows:

a. FCST is an interagency group advisory to the President. The fact that it is advisory is not a real limitation on its utility. The fact that it is interagency means that it can in fact deal effectively only with problems which affect more than one and usually several agencies.

b. The forum function is extremely important. Discussion of problems in FCST generally stimulates a wider range of ideas than would result from bilateral discussions between OST and individual agencies. Conversely, FCST is a useful means of conveying information and views from the President and his Executive Office to the agencies.

c. As a product of discussions in OST and of the work of OST committees, it is possible to provide advice which is in fact a decision when a consensus can be reached. This is generally possible except when basic differences exist among the agencies.

d. FCST has been criticized for not exercising leadership. It is difficult for an interagency group to exercise leadership. This is more of a function of OST than FCST. The Council on Marine Resources and Engineering Development, set up at a high level, is an interesting experiment in planning and action by an interagency group, and represents about as strong a test effort for this mechanism as could be devised. The problems of interagency coordination have not been solved, and the experience of the Marine Council, FCST, and the National Aeronautics and Space Council should be useful as administrative patterns evolve.

(F) Long, F. A. President Nixon's 1973 Reorganization Plan No. 1: Where do science and technology go now? Science and public affairs, v. 29, May 1973: 5-8, At p. 6.

Perhaps the most important functions of OST were its internal studies of total U.S. programs in specific areas of science and technology, and its programs of coordination of the separate federal efforts. The Science Advisor, who was also Director of OST, served as chairman of the Federal Council for Science and Technology (FCST), the explicit coordinating mechanism for the many science and technological programs that cut across the responsibilities of the different departments and agencies of the federal establishment. The overview and coordinating responsibilities of OST were a natural response to the fact that particular fields of science were often of importance to several quite differently oriented federal agencies.

(G) Science advice for the White House [extended selections from a discussion of science policy by six Presidential science advisers at MIT, Oct. 4, 1973] Technology review, v. 76, January 1974: 8-19. At p. 13.

The following excerpt is taken from the remarks of Dr. Edward E. David, Jr., Chairman, Federal Council for Science and Technology, 1970-1973:

Concerning coordination, it is clear that one of the most influential accomplishments of the former White House office was successfully encouraging civilian departments—such as the Department of Transportation, the Department of Housing and Urban Development, the Interior Department, and the Commerce Department—to establish their own research and development organizations and programs, just as the White House apparatus had earlier encouraged the establishment of the Office of the Director of Defense Research and Engineering and N.A.S.A. But with that success in establishing research and development capability in many civilian agencies came the inevitable territorial competition, for cooperation and coordination are simply not the norm between departments of government. However, we know that coherent programs across the boundaries can be attained with some encouragement and leadership. The Federal Council for Science and Technology (F.C.S.T.) was established with the Science Adviser as its Chairman for this purpose.

For example, the research in environmental health that goes on in the government today is the business of the National Institutes of Health, the Environmental Protection Agency, the Food and Drug Administration, the Atomic Energy Commission, and several other agencies. An F.C.S.T. Committee has been actively working with representatives from each of these agencies to create an overall program

having both an adequate basic, long-range side located in the National Institute of Environmental Health Sciences and the A.E.C. and an applied side to tie to the regulatory needs of the Environmental Protection Agency, the Food and Drug Administration, and the A.E.C. One particular effort, for example, was to achieve balanced funding of the new National Center for Toxicological Research in Pine Bluff, Ark. Efforts such as these are becoming an ever-more essential function, since most of the new civilian-oriented national programs cut across the interests of several operating agencies and departments of government.

(H) U.S. Congress. House. Committee on Science and Astronautics. 1975 National Science Foundation authorization. Hearings before the Subcommittee on Science, Research, and Development of the . . . March 12, 13, 14, 15 and 19, 1974. 93d Congress 2d session. Washington, U.S. Govt. Print. Off., 1974. 863 p. At pp. 765-767.

Excerpt from statement of Dr. Russell C. Drew, Director of the Science and Technology Policy Office (STPO), National Science Foundation:

At this time, I would like to cite briefly just a few of the activities in which STPO has provided advice and support to the science adviser and has provided science policy input to the overall policymaking process with[in] the Federal establishment:

STPO represents the Science Adviser on White House Domestic Council studies, providing a source of technical inputs on a range of domestic questions such as materials policy and environmental quality issues.

On behalf of the science adviser, STPO has been involved in the annual budget review process, assisting and advising the Office of Management and Budget on selected agency R. & D. budget issues.

STPO provides staff support for the Federal Council for Science and Technology. This council was established by Executive order in 1959 and includes as members the senior policy-level science and technology officials of the Federal Government. Its responsibilities include interagency relationships in science and technology, improved planning and administration of Federal science and technology programs, identification of research needs, better utilization of Federal facilities and resources, and furtherance of international cooperation in science and technology. From this broad charter, it is obvious that the FCST has an important role to play and it is our intention that it become a more effective mechanism for achieving these objectives. To aid in strengthening the FCST, STPO staff members have been designated to monitor and assist activities of the FCST and its many existing subcommittees. In addition, we have taken the lead in developing plans to establish new FCST committees to deal with emerging issues such as intergovernmental technology and materials sciences.

As part of our program of enhanced communication, the office has participated in organizing the first two of a continuing series of meetings with leaders of the scientific and technical community to enable direct dialog with the Science Adviser on issues of national science policy. One meeting involved professional societies and the other, major representatives of R. & D. in industry.

It will be the policy of this office to bring our major study activity into the public domain expeditiously so that the information produced will be available to all interested parties. In this regard, we have recently published several reports which were begun under the previous science advisory structure. These include the PSAC panel report on "Chemicals and Health" and the "FCST Annual Report of Water Resources Research."

We also were involved in the fiscal year 1975 annual budget review process, assisting the OMB and advising them on various priorities in selected agency program areas.

In this regard to the Federal Council for Science and Technology, Mr. Chairman, I would like to mention that we see a stronger, and I think, a more vital role for this mechanism that exists within the Federal Government for coordinating and communicating among the Federal agencies. I should just make reference to the measures within both the House and the Senate, on one of which we testified on earlier this week, concerning long-range planning and the ability to integrate all of the various science and technology resources and apply them to these particular problems. We feel this is a very important role and we see this role as one which the Federal Council can play a very important part.

Mr. MOSHER [Chas. A., Rep. Ohio]. Can I interrupt again, Mr. Chairman?

Were you just saying that you felt that the Federal Council for Science and Technology can play a much larger role than it has been playing?

Dr. DREW. Yes, sir.

Mr. MOSHER. Someone told me the other day it was a largely dormant organization, is that a false rumor?

Dr. DREW. I'd like to address that point because I think that if that is the conception here, we would like to try to shed some additional light and be on the record concerning what we feel is a, if you will, a resurgent Federal Council.

Mr. MOSHER. Resurgent as of when?

Dr. DREW. I will provide some history for you. Dr. Stever, when he was considering his new responsibilities, this is actually before our office existed, in the spring of last year, conducted a number of discussions with participants in the Federal Council with the objective of looking at the role that it had been playing and the role that it might play, to determine how useful it had been, what its strengths and weaknesses were, to try to get a better view of the Federal Council as a mechanism within the Federal Establishment. The results of that review with agency heads like the Administrator of NASA and others, was an agreement for a new look which

included the review of all of the Federal Council standing committees. That review resulted in dropping several committees in tightening up the operation of several others, and this decision to look at the prospects initiated several new Federal Council committees.

Mr. MOSHER. When was that?

Dr. DREW. This was done in the period of April through June of 1973.

The Federal Council principals also decided that it was in their interest to meet as a committee of the principals less frequently but on more important major issues, and so the Federal Council principals meet twice a year, in the spring and in the fall, and conduct meetings in the interim period on an ad hoc basis on specific issues, but not as a committee of the whole.

We have felt that this is the best way to strengthen the operation and bring it to top level attention. If you get top level people and try to have them meet bi-weekly, gradually you will reduce the level of attendance and participation.

Mr. MOSHER. Who has the responsibility for convening those ad hoc—

Dr. DREW. This is the responsibility of the chairman. We have had several of those sessions, and we are preparing now for the next spring meeting of the FCST's principals which will be on April the 11th. The FCST, I believe, with the sort of leadership we expect the chairman, Dr. Stever to provide, can be a much more dynamic mechanism.

Mr. MOSHER. You are assuring us that this is a resurgent operation, that is significant.

Dr. DREW. Yes, sir.

Mr. MOSHER. I am content, Mr. Chairman.

Dr. STEVER. May I modify that? We will assure you we will try to make it effective.

Mr. MOSHER. Are you saying that perhaps the rumor that it has been dormant has some truth to it?

Dr STEVER. In my opinion the Federal Council previously did not play a very strong role, this is when I was a member and not chairman. It does play one very important part that isn't very visible. You know, any one of the technologies or sciences we talked about here, is really very complex—a complex piece of business. There are several agencies, often many agencies, in these things and there is need for an immense amount of coordination and interchange. Some of these Federal Council Science and Technology committees have been extremely successful, quietly conducting the business of the country, not getting their names in the newspaper, but doing something terribly important. Dr. Robert White heads the Committee on Marine Sciences. It has been a very successful one. Dr. Todd in NSF heads one in atmospheric sciences, a very successful one. We have a number of these that work very effectively.

Now, that doesn't get the headlines, you know, they don't come out and make a great statement every time there is an

issue. It is something of importance, and that role of the FCST has been played very effectively, but everybody looks to the main body of FCST and what they are doing. That is the one we are examining at the present time.

(I) U.S. Congress. House. Committee on Science and Astronautics. Federal policy, plans, and organization for science and technology; part II. Hearings 93rd Congress 2d session, June, July 1974. Washington, U.S. Government Printing Office, 1974. 826 p.

Excerpt from statement of Dr. Robert C. Seamans, Jr., President, National Academy of Engineering: (At p. 18).

How do we now identify, and achieve consensus, on the critical domestic problems to be addressed by the Federal Government? Ultimately, of course, we do it through the budgetary-appropriations process. The annual budget, as modified by appropriations acts, constitutes the definitive description of current Federal priorities. This process is triggered, on occasion, by ad hoc reaction to crisis: For example, Sputnik, civil rights, poverty, environmental degradation, imbalance of trade, and now, energy. What we do best is react and play catchup. We do not plan ahead in a systematic way.

The mere identification of critical problem areas presents little difficulty, in my opinion. One could prepare an almost inexhaustible list of writers, legislators, public officials, panels, commissions, symposia, interagency committees, White House conferences—all having identified similar national needs, goals and priorities. What is critical, however, is the organizational mechanisms for making specific program choices among competing priorities and recommendations for solutions. Here it seems to me, a distinction should be drawn between policymaking and interagency coordination.

Historically, the Federal Council on Science and Technology performed the coordinating role. While knowledgeable concerning the R. & D. activities of their respective departments and agencies, many of the members of this Federal Council have generally lacked either broad program policy jurisdiction or the authority to commit their respective agencies to program and budget decisions. At most, it has provided an information and coordination capability and, in some cases, a bargaining forum—but not a Federal-wide policymaking or science and technology measurement instrumentality. It seems to me, therefore, that a different body is required to evaluate and rank critical domestic problems in light of their science and technology components and then recommend program assignments to the various departments and agencies for implementation. In those instances where neither departmental nor agency capability exists for the conduct of a program, organizational changes must be implemented before the program can be initiated.

What is clearly needed is an alternative to crisis-based reactive decisionmaking.

(J) U.S. Congress. House. Committee on Science and Astronautics. Federal policy, plans, and organization for science and technology; part II. Hearings 93rd Congress 2d session, June, July 1974. Washington, U.S. Govt. Print. Off., 1974. 826 p.

Excerpt from statement of Dr. Edward Wenk, Jr. in which he urged that attention be given to institutional remedies needed to be incorporated in new legislation for science and technology policy. (At p. 419-420):

Third, there should be explicit provisions for coordination of policy as well as programs of the vast number of federal agencies involved in utilizing technology to accomplish their mission. Adding horizontal warp to the woof of vertical government structure is a long standing problem in public management. There are very few major national goals where achievement rests on the missions and underpinning of specialized research and development of a single agency, and it makes no sense to reorganize each and every time a new challenge arises.

Indeed, mobilizing all of the technological engines of federal bureaucracy to focus on common social goals is one of the most bewildering enigmas of modern democratic government. The problem is how to gain a sense of unity and direction when the compartmented bureaucracy, created one step at a time, is constantly stressed by pluralistic goals of our society and outside clientele. Under such battlefield conditions, the fragmentation leads to ineffective management in achieving goals; worse, it can generate stalemate. The fundamental process for gaining coherence is coordination.

But few carrots and sticks are available to the President to foster coordination. Each agency is expected to advocate its functions in the face of impediments. The constellation of federal agencies, however, may be thought of as multi-program instruments that can be wired together in new ways to accomplish unprecedented requirements. Some of the most creative moves of the Marine Science Council arose from recognition of the potency of such cross connections, rather than creation of new organizations.

Coordination becomes the proving ground of effective public administration. It is the sense of community, the suppression of parochial interests to a common weal, the systemic rather than sectorial approach that ultimately tests the degree to which a public enterprise can fulfill its purpose. The proposed Council cannot intervene between the President and Cabinet officers, but it should have a license to serve as more than an umpire in helping the President to adjudicate disputes, by constructively harmonizing relevant elements in a systems approach to public administration. In an environment of departmentalism, coordination must operate through consensus. In the context of commonly developed fact, techniques employ mediation and persuasion.

The Federal Council for Science and Technology was created by executive order in 1959 to serve these coordinating tasks. It has had a chequered career. Among other factors, the President's science advisor as its chairman has often been too busy or sparing of his energies in stubborn, time consuming persuasion to make it work. And it has suffered by lacking statutory support. Paradoxically, the Congress which has a long record of intent about exorcising the devils of waste and duplication, has never taken initiatives to underpin the FCST with legislative authority. It should.

¶ (K) U.S. Congress. House. Committee on Science and Technology. The national science policy and organization act of 1975. Hearings before the . . . on H.R. 4461 and H.R. 7830. 94th Congress 1st session, June 10, 11, 17, 19, 23, 1975. Washington, U.S. Govt. Print. Off., 1975. 1041 p. At pp. 658-659.

Excerpt from paper submitted by A. Michael Noll, Some Advice on Science Advice. Mr. Noll was a Technical Assistant to the Director of the Office of Science and Technology from June 1971 to June 1973:

I.B.2.(c) The Federal Council for Science and Technology

The Federal Council for Science and Technology had fractionated itself into a considerable number of committees, subcommittees, panels and subpanels. The net result was unmanageable, and most of the panels and subcommittees were under the control of agencies rather than under the control of the Science Advisor or the OST. The FCST and its huge bureaucracy of committees actually formed constituencies for some of these committees thereby making it virtually impossible to eliminate them even though the problems for which the committees were originally formed had been solved years ago.

To a considerable extent, the bureaucratic problems with the FCST were to be expected because of the level of bureaucrats who were frequently attracted to its activities. Some of these bureaucrats decided that the quickest course to higher level jobs in the government was through chairmanship and membership on the FCST subpanels and subcommittees. For them, the task for which the committee was formed was secondary to the task of furthering their own careers.

The reports issued by the FCST were frequently quite self-serving to the bureaucracies involved and were frequently naive as to budgetary constraints or organizational matters.

The FCST portion of the White House science advisory mechanism was in need of tight management and control.

I.B.3. A Decision to Dismantle

Within the Executive Office of the President (EOP) considerable battles occur between the various constituent agencies—they are definitely not all of one mind. The White House science advisory mechanism was no exception and certainly on occasion found itself in conflict with other

elements within the EOP. And from these conflicts, enemies were made.

The PSAC and FCST portions of the advisory mechanism with their many panels and committees were undoubtedly a source of concern to the various bureaucrats within the EOP and White House who frequently found themselves reviewing and attempting to de-fuse the innumerable reports and recommendations issued by all these panels and committees. Thus, more friends were lost.

When the opinions of all were finally polled to determine the future of the White House science advisory mechanism, the nays—caused in particular by the political embarrassments caused by the PSAC—carried the final decision: the mechanism would be dismantled.

(L) U.S. Congress. House. Committee on Science and Technology. The national science policy and organization act of 1975. Hearings before the . . . on H.R. 4461 and H.R. 7830. 94th Congress 1st session, June 10, 11, 17, 19, 23, 1975. Washington, U.S. Govt. Print. Off., 1975. 1041 p.

Responses of Dr. H. Guyford Stever, Science Adviser to the President, to questions regarding the Federal Council for Science and Technology: (At pp. 96, 62).

Q. 10. How has the Federal Council on Science and Technology been restructured? What are its present functions, and what examples can you cite illustrating their achievements and resulting impacts of their work during the past year?

A. When I assumed Chairmanship of the Federal Council in 1973, I initiated a re-examination of its Committee structure—the principal vehicle for Council activity. As a result, we terminated certain committees whose work was essentially completed and transferred the responsibility for several others to individual agencies whose mission responsibilities appeared to adequately encompass the responsibilities entailed. Subsequently, we formed new committees to deal with emerging problems, specifically on Social R&D, International Geodynamics Research, and (jointly with the Council on Environmental Quality) an ad hoc task force on Inadvertent Modification of the Stratosphere. I appointed a full-time Executive Secretary and created an Operating Committee to support the Council's work at the staff level. The basic functions of the Council remain two-fold: to develop coordinated agency positions on matters of R&D administrative policy that are of mutual interest (e.g., patent policy and certain aspects of procurement policy) and to provide an "institutional shelter" for new substantive problems that involve the mission interests of two or more agencies (e.g., climate research and R&D relating to critical materials). The Council's committees published some half-dozen reports during the year just passed, embracing a variety of topics ranging from capital requirements for oceanographic research to the possibility of depletion of the stratospheric ozone layer by fluorocarbon

releases. Each of these reports has been influential in the formulation of technical agency R&D priorities and, in some instances in developing the perspectives of the Federal and State regulatory bodies, the industrial and academic research communities and international bodies of which the U.S. is a member. It should be recognized, I believe, that the very process of developing these analyses on an interagency basis has an important positive impact on the way in which the mission agencies view their responsibilities and develop their programmatic responses.

Q. 6. How would you propose to make the Federal Council for Science and Technology a "more effective instrument for interagency coordination?"

A. 6. Elsewhere, I describe actions taken in the last two years that have been designed to increase the effectiveness of the FCST. It must be remembered that the FCST is primarily a coordinating body rather than an operational or decision making group. Within this context it is possible to address specific new problems, for example, the inadvertent modification of ozone concentrations in the stratosphere. The examination of these issue-oriented questions that embrace capabilities of a number of Federal departments and agencies has proven to be useful and the initiation of additional problem focused activities is a principal way to increase the FCST effectiveness.

A LOOK AHEAD: QUESTIONS FOR SUBCOMMITTEE CONSIDERATION

As of mid-July 1976, there is still no word on who will be nominated to head the new Office of Science and Technology Policy or even on whether a nomination will be made in what remains of the 94th Congress. Certain arrangements for the OSTP are underway but the important decisions concerning the implementation of Public Law 49-282 can only be made when a Director takes over. The choice of the Director of OSTP is important to the future of the Federal Coordinating Council for Science, Engineering, and Technology because Public Law 94-282 specifies that the Director shall be the Chairman of the Council.

The similarity of Title IV of Public Law 94-282, which established the Federal Coordinating Council, to Executive Order 10807 of March 13, 1959, which established the Federal Council for Science and Technology, was shown on the overlay which concluded the legislative history of Title IV in section VII of this report.

COMPARISON OF TITLE IV WITH E.O. 10807 AND IMPLICATIONS FOR FCCSET

The following sectional analysis of Title IV is a comparison with the authority of E.O. 10807 for the FCST. Because the two documents are so similar, the aspects where they differ take on added significance. Questions concerning these differences which the subcommittee may wish to explore are suggested following the analysis of each section.

New Title (Sec. 401(a)).—The additions of the words "Coordinating" and "Engineering" to the former title raise certain questions. The addition of "Coordinating" would seem to emphasize the primary

function of the new Council. It may also have been added to distinguish the main function of this Council from earlier proposals that would have established a Council of Advisers on Science and Technology as a science advisory office in the Executive Office of the President.

The functions set forth in sec. 401(e) for FCCSET do not include the word "coordination" although this is certainly implied. It would appear that the functions set forth in sec. 401(e) are broader than coordination, involving also planning, administration, and cooperation. Will the inclusion of "coordinating" in the Council's title tend to limit its scope?

The inclusion of "Engineering" in the title of FCCSET, on the other hand, would seem to indicate that its focus has been considerably broadened. Former Executive Secretary John Granger observed in 1975 that the reach of the Federal Council for Science and Technology was limited to governmental problems as opposed to national problems and he said the Federal Council had not been concerned up to that time with: (1) Technology as a factor in the economy; (2) the impact of foreign technology policies on the health of our scientific and technological enterprise; (3) improving U.S. productivity; (4) technical assistance as international political strategy; and (5) engineering manpower. Will the FCCSET find it necessary to recast its functions in broader terms than heretofore?

Membership (Sec. 401(b)).—The expansion of membership of FCCSET from that of the original FCST reflects in large part a need to include recently-formed departments and agencies with substantial scientific and technical functions. Unlike E.O. 10807, Title IV does not designate any specific representative of any department or agency to be a member of FCCSET, but leaves the selection to the head of each designated agency, requiring only that the selection shall be an official of "policy rank."

A perennial complaint about the FCST was that its designated members (heads of agencies or assistant secretaries of departments) did not attend meetings regularly and sent lower-level substitutes, which tended to weaken the Council's ability to be effective. Attendance checks during certain periods of the Council revealed that some agencies were represented by their designated members more consistently than were others; a few sent substitutes most of the time. This was not necessarily bad for it is understood that some substitutes were as effective agency representatives as the designated members. What policy level of department and agency representatives is required to represent departments and agencies on Council affairs?

Can a department or agency be as effectively, or more effectively, represented on FCCSET business by a lower-level policy representative than was previously designated for the FCST?

Might a Deputy Assistant Secretary for Research and Development who regularly attends Council meetings be a better choice than, for example, an Assistant Secretary who rarely comes?

Chairman (Sec. 401(c)).—Title IV designates the Director of OSTP to serve as Chairman; formerly the Chairman was designated by the President. Present authority permits the Chairman to designate another member of the Council to act temporarily in his absence.

The Director of OSTP will be a busy man for he will have multiple positions under the new arrangements as he did before. During the 1974 hearings on S. 2495, Dr. Edward Wenk, a former Federal Council executive secretary, noted as one factor in the "checquered" career of the Federal Council that "the President's science advisor as its chairman has often been too busy or sparing of his energies in stubborn, time consuming persuasion to make it work." Public Law 94-282 provides for up to four Assistant Directors of OSTP to be appointed. Could one of these Assistant Directors be delegated responsibility for chairing the FCCSET?

Other representation at meetings (Sec. 401(d)).—This authority to permit the Chairman to request heads of agencies not heretofore designated as members to participate in meetings and to invite other persons to attend meetings of the Council is the same as in E.O. 10807. Should large departments such as Health, Education, and Welfare and Interior, for example, have more than one representative at Council meetings?

The Federal Council had both member and observer representatives. Can additional representation be invited on a limited basis, such as that of observer, under the new authority?

What is the optimum size for Council meetings?

Can a policy rank official be represented by a non-policy rank substitute?

Should guests be permitted, and if so, limited in number?

Should participation by State and/or local government representatives be invited?

On the point raised by the last question, Dr. Stever, in testimony in March 1974 on S. 2495, stated that the National Science Foundation "favor[s] the proposal to include State and local government representatives in the Council. We believe this can be effectively accomplished by augmenting membership of the present Federal Council for Science and Technology and its subgroups."

Functions (Sec. 401(e) and (f)).—The functions assigned to the new FCCSET are lifted almost verbatim from the functions enumerated in section 2(a) (1)–(4) and section 2(e) of E.O. 10807. One change is the insertion of "engineering" between "scientific and technological" in the text wherever these words appear. Also, the former general charge to the Council to perform "related duties as assigned by the President or by the Chairman," is retained but it is now specified that the duties shall be of an "advisory" nature.

Elements of the original assignment of functions in E.O. 10807 which do not appear in Title IV include:

(1) The former assignment to the FCST to consider problems and developments in the fields of science and technology and related activities concerning the overall advancement of the Nation's science and technology.

(2) The further assignment to the FCST, in developing the functions presently incorporated into Title IV ((e)(1)–(4)), to consult with enumerated and other organizations and to consider the effects of Federal R&D policies and programs on non-Federal programs and institutions and vice-versa, and to consider long-range program plans.

(3) The former assignment to consider and recommend measures for the implementation of Federal policies concerning the administration and conduct of Federal programs in S&T, and

(4) The direction to the Chairman of FCST to submit to the President those recommendations or reports of the Council which require the attention of the President.

The legislative history of this section in S. 32 as reported states an intention that the new coordinating body "exercise the same functions as those heretofore exercised by the Federal Council for Science and Technology." (S. Rept. 94-622) The conference report noted that "the title adds no new functions." How can the Council exercise the "same functions" when these functions represent only part of the original assignment? What are the implications of the inclusion of "engineering" on the assignment to the Council?

Assistance (Sec. 401(g)).—This subsection which directs member agencies of the Council to furnish necessary assistance by detailing employees or undertaking special studies is essentially the same as the original language in E.O. 10807. Omitted, however, from Title IV is a further direction to Federal agencies to provide the Council with information and reports relating to the scientific and technological activities of their respective agencies when requested to do so by the Chairman. Is the deletion of this latter information requirement apt to lessen the Council's capability to be fully informed concerning the relevant activities of Federal agencies?

Standing Subcommittees and Panels (Sec. 401(h)).—The authority in Title IV to establish standing subcommittees and panels is found in E.O. 10807. A previous requirement that one of the standing subcommittees shall be composed of scientist-administrators to provide a forum for consideration of common administrative policies and procedures relating to Federal R&D activities was not carried over into Title IV.

There are presently fourteen committees and one task force under the Federal Council umbrella. Periodically, Federal Council chairmen have conducted reviews of standing and ad hoc committees to determine whether they should be continued, terminated, transferred to a lead agency, merged with another, or whatever. Under Dr. Stever this has been an annual affair. It is not easy to eliminate an inter-agency committee that has been in existence over a period of time. William Carey has observed, "Prestigious committees at the Presidential level acquire, over time, a liturgical untouchability. They outlast Presidents and administrations. If their mission or usefulness is in doubt, the time to put them to rest is in the first months of a new administration."

Interagency committees under the Federal Council could be organized without compliance with the requirements of Executive Order 11671 of June 7, 1972 on Committee Management. This Executive order lays down requirements under which interagency or advisory committees may be established, including approval of charger, specifies a termination date of two years from formation unless a determination to continue it in the public interest is made 60 days before the scheduled termination, sets out various operating procedures, including open meetings, provides for the establishment of committee management officers in departments and agencies having such committees, and other details.

Several questions are suggested:

Should interagency committees organized under FCCSET or those from FCST which might be incorporated under FCCSET be subject to the Committee Management regulations?

Should interagency committee meetings be open to the public?

Should all interagency committees to be established under FCCSET have a finite life?

What kinds of controls should FCCSET exert over committees associated with it?

Under what authority in E.O. 11671 on Committee Management were interagency committees of the Federal Council exempt from compliance?

What new interagency committees might be needed under the FCCSET, assuming that the Council may be given important assignments in support of the OSTP or the President's Committee on Science and Technology? Who should pay for publication of interagency committee reports?

Should a uniform procedure be established for the promulgation of policy statements and guidelines, making clear which are interagency committee agreements and which have been approved by the FCCSET?

The Federal Council for Science and Technology is abolished (Sec. 402.)—Initially, it appeared that the legislative intent was not to abolish the Federal Council for Science and Technology but to upgrade and strengthen it. The addition of Sec. 402 would appear to give the new Chairman of the FCCSET considerably more authority to restructure the Council than might otherwise have been possible. Since the Federal Council for Science and Technology was technically abolished with the signing of P.L. 94-282 on May 11, 1976, what is its present status and that of its interagency committees?

OTHER QUESTIONS RELATING TO FCCSET

Relationship of FCCSET to OSTP

The functions assigned to the Director, OSTP, and to the Office under Public Law 94-282 are much more detailed than the assignment to the former OST under Reorganization Plan No. 2. What thought is being given to organizing the FCCSET to enable it to assist OSTP in the discharge of these broad functions? For example, two major new functions which would appear to require a considerable expenditure of time and resources are the preparation of the five-year projections and an annual science and technology report. Both of these tasks will be annual affairs. Both will require input from the same departments and agencies which constitute the FCCSET. The functions of FCCSET appear to be broad enough to enable it to assist in both these tasks. Would this be a feasible assignment? Could standing committees under FCCSET serve as centralized sources for channelling agency input on a continuing basis?

The "Report on the R&D Program for fiscal year 1976" which the Federal Council published with the submission of the Federal budget for that year was a new activity, and, although admittedly with shortcomings, was a useful document. The collection of these data was done after decisions on agency budget levels had been made.

In the past, the Federal Council committees have been helpful in recommending projected Federal budget levels for multi-agency R&D programs, such as oceanography, water resources, and others.

How can the FCCSET be organized for optimum assistance in coordinating the "R&D" budget?

FCCSET assistance in Federal science, engineering, and technology survey

The comprehensive assignment to the President's Committee on Science and Technology and the relatively small staff and short time frame specified will make it necessary for the PCST to utilize many existing sources of information. Here again the FCCSET would appear to provide a useful tool for the aggregation of information on many of the aspects of the Federal science, engineering, and technology effort enumerated in section 303 of Public Law 94-282. How might the FCCSET be organized to assist in this effort?

FCCSET interface with Intergovernmental Science, Engineering, and Technology Advisory Panel

The former Committee on Inter-governmental Science Relations of the Federal Council, in existence from 1969 to 1972, was a catalytic force in the effort to promote a wider State interest in the potential of utilizing science and technology in alleviating current problems and in the establishment of State science advisory offices to serve governors and State legislatures.

How might FCCSET and the Intergovernmental Science, Engineering, and Technology Advisory Panel establish a mutually beneficial relationship? Should periodic joint meetings be scheduled? Should there be observers from each body at meetings of the other?

Staffing the FCCSET

The staffing of an interagency coordinating body is crucial to its success. Agency officials understandingly owe their first allegiance to their agencies. Few awards accrue to officials who serve the national interest over that of the agency which pays them.

Throughout the entire history of the Federal Council for Science and Technology, inadequate staffing appears to have been a problem. What is accomplished at meetings is largely dependent upon the amount of advance preparation and follow-up work. When the FCST was meeting almost monthly this was a lot of work. Staffing for the Federal Council came from the OST during its existence, and from STPO after its transfer to the NSF. OST Directors told the Congress on a number of occasions that a full-time Executive Secretary served the Federal Council, but the records seems to show that the Executive Secretary regularly had other assignments. When all of an individual's time is used for things of the moment, there is little left for reflection or planning ahead or innovation. It is understood also, that support for Executive Secretary has also always been a bare minimum.

The situation in May 1976 was that the Executive Secretary also headed a section in the Science, Technology and International Affairs Directorate of NSF. It is understood that his administrative assistant was the *only* employee working full-time on Federal Council affairs. It seems pointless to consider a larger role for the new FCCSET if it is going to be staffed on the level the Federal Council has been staffed.

Nor does it seem likely that a voluntary Operating Committee can fill this gap. Dr. Edward Wenk, after experience as Executive Secretary of both the Federal Council and the Council on Marine Resources and Engineering, identified "provision of sufficient professional staff to develop facts, analysis of issues, and recommendations for action—after consultation with the agencies and other interests involved, but independent of such special interests" to be a key factor in the success of Executive Office level coordinating bodies.

What staffing level might be an optimum one to consider in organizing the FCCSET?

Funding

The Federal Council for Science and Technology and its committees were always dependent on some other budget from which to meet its needs. Until its transfer to the National Science Foundation, it is understood that the Council did not have funds to publish reports, buy stationery, etc.

William Carey, former long-time Bureau of the Budget official, in testifying in 1970 on the problems of Presidential advisory committees illustrated the problem:

I shall make one more point, and be through. We have some 3 million Government employees and a budget of \$200 billion. It seems to say that a President has inexhaustible resources to call on. It is an illusion. When I was in the Bureau of the Budget, we never knew where to turn for the small sums needed to pay for a study or an advisory body. I spent uncounted hours going from one agency head to another, hat in hand, begging for alms to pay for advisory projects which the President wanted. The White House had no purse for this, and the grandeur of the Presidency was diminished time after time as he had to put the touch on the agencies or ask the advisers to pay their own expenses.

Mr. Carey urged the President have at his disposal a fund for special studies. A budget for the new FCCSET might be justified on the same basis.

Has consideration been given to this very real problem?

Meetings

Title IV does not contain the provision in E.O. 10807 which stated "The Council shall meet at the call of the Chairman," perhaps because this is a generally accepted practice. Does the omission also raise the possibility that the Council could meet on the basis of some other initiative?

Throughout most of its existence, the Federal Council for Science and Technology met at least every other month or more often. For the past three years, the meeting schedule was reduced to two plenary meetings each year, with provision for calling such special and ad hoc meetings as become necessary.

How often does a coordinating council with the functions of the FCCSET need to meet? If there isn't enough continuing business to meet more than twice a year, how can continuity be maintained? How is it determined what justifies calling special meetings? How can attendance at meetings be improved? Do meetings always need

to be held in the same place? Would it be feasible to have members host meetings at their particular agencies from time to time?

Consensus

A common complaint of informed critics of the Federal Council is that decisions coming from the Council are so watered-down as to reflect the least common denominator and consequently are of limited value. What other means can be used to record agreement? For example, can the congressional committee system of recording minority views be used? Are there other ways to achieve agreement, as for example, through arbitration?

Institutional Memory

The experience of the Federal Council should be instructive to the new FCCSET. Perhaps because of inadequate staffing, the Council's records were not maintained in a form to be an authoritative basis for staff coming later on the scene. For example, it is understood that the lack of an authoritative record of policy statements and guidelines was a matter of recent concern to the Federal Council. FCST actions have been reported in minutes. While at one time, the minutes were detailed accounts of actions and discussions at meetings, and agreements reported therein were regarded as binding, in recent years minutes have been reduced to the barest statements of actions. Failure of the Council to report publicly on its activities in a regular and available form has further served to lower its visibility. The FCST was aware of these inadequacies and was recently engaged in redressing the situation, in particular with respect to codification of policy statements and the preparation of an activities report.

What measures can the new FCCSET take to avoid this problem in the future?

Executive Privilege versus Openness

As an advisory committee composed entirely of full-time Federal employees, the Federal Council for Science and Technology was exempted from compliance with the Advisory Committee Act under section 3(2).

What is the case for voluntary compliance with the requirements of the Advisory Committee Act? What is the case for holding closed meetings?

Congressional Relationships

The imminent hearings of the Domestic and International Scientific Planning and Analysis Subcommittee on the Federal Council will undoubtedly be instructive even to those most intimately engaged on Council business and to officials in the science and technology oriented departments and agencies and the public at large.

How can meaningful relationships be maintained without at the same time prejudicing the FCCSET's role as an advisory body in the Executive Office of the President?

The Federal Council on Marine Resources and Engineering Development as an Effective Body

The Marine Resources Council is frequently cited as an example of an effective interagency mechanism. It was established by P.L. 89-454 in 1966 and continued in existence until 1971. Again quoting William

Carey, the following is his explanation of how the Marine Resources Council differed from other less effective bodies and what made it more effective:

At the other end of the spectrum, we have the Federal Council on Marine Resources and Engineering Development. This is another interagency committee but it advises the President. What was different about it was that this Council was created by statute with a fixed-time period. Its chairman was the Vice President of the United States. Its executive secretary had a Presidential appointment. Its money came through an appropriation.

This doesn't necessarily mean that the Council would have been more than window dressing. In fact it has been very lively. When Mr. Humphrey had the chairmanship, he always came. He ran the meetings as though he was still in the Congress. Before each meeting, individual members would get a letter from the Vice President saying that he would be greatly disappointed not to see them at the meetings and as a result, there was a remarkable attendance record.

Now, the Marine Council was not hesitant about advising the President. In fact, the President got more advice than he cared to have. I think it comes down to saying that this body was a success.

Was it because of Mr. Humphrey, or because its secretary had a Presidential commission, or because it had a fixed-time period on its life, or because oceanography is important, or because an appropriations hearing lay around the corner; or did all these factors have a bearing on the results?

Presidential Interest

Under Executive Order 10807, the Chairman of the Federal Council was authorized to submit to the President such of the Council's recommendations as required his attention by reason of their importance or character. This probably reflected the situation as it was before the establishment of OST, when the Federal Council was a part of the Office of the Special Assistant for Science and Technology.

An "expression of interest by the President in specific topic areas that cross different agency lines and have a Presidential priority, but fail to be the prime responsibility of any single agency" has been identified by an informed observer as an ingredient for success of an Executive Office level coordinating body according to Dr. Edward Wenk.

What Presidential tie-in is the FCCSET expected to have?

CONCLUSION

This contemporary history of Federal interagency coordination for scientific research and development began by calling attention to the diffusion of scientific and technical activities throughout the Federal Government, and to the necessity for coordination of effort. Over almost three decades, the Federal Council for Science and Technology, and the Interdepartmental Committee on Scientific Research and De-

velopment, which preceded it, have been charged with this coordinating responsibility—during the administrations of Presidents of both parties, under a succession of chairmen, and while located alternately in the Executive Office of the President and the National Science Foundation.

Figure 1 is a graphic representation of the spiral course of inter-agency coordinating responsibility for scientific research and development and science and technology since 1947. It illustrates a three-step pattern which has already been completed twice:

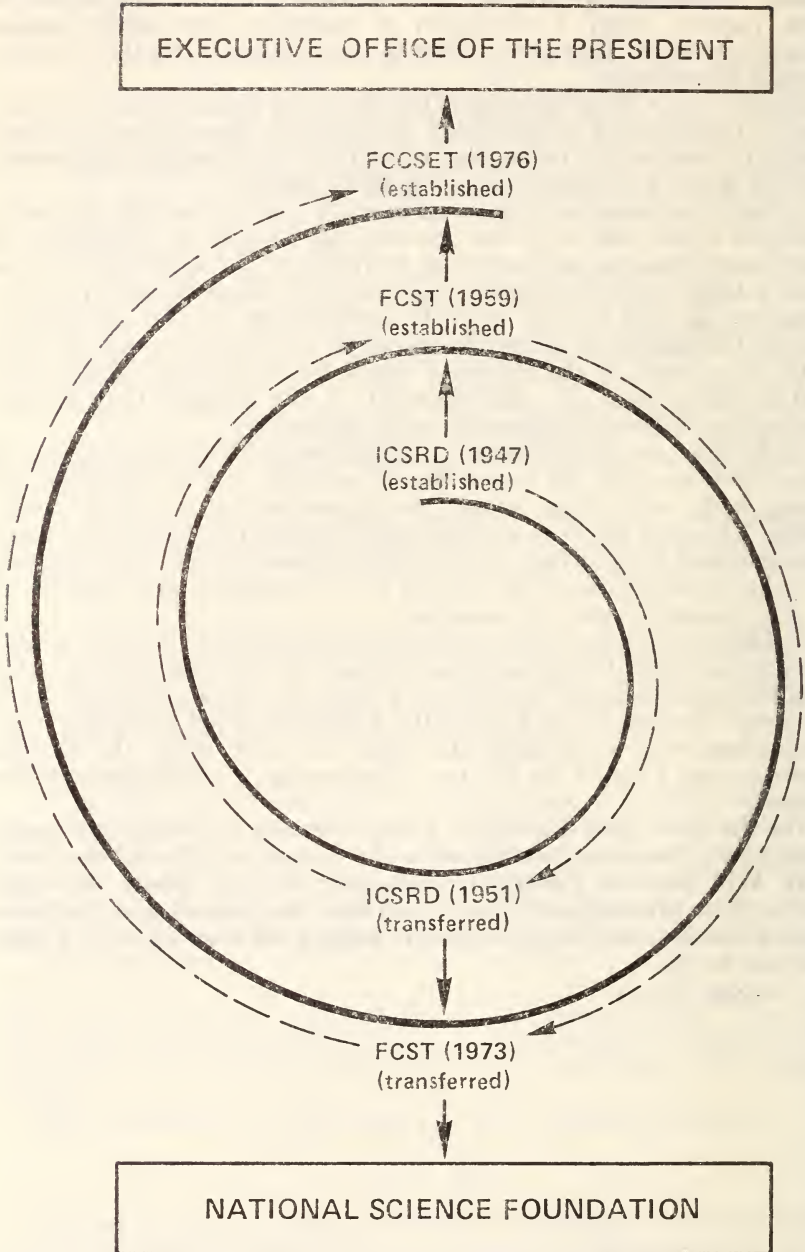
1. Some combination of national needs requiring scientific and technological input points up the necessity for having an instrument to coordinate scientific and technical activities at the highest level, and such a body is established in the Executive Office of the President. This was the case in 1947, with the establishment of the Interdepartmental Committee on Scientific Research and Development, in 1959, with the creation of the Federal Council for Science and Technology, and in 1976, with the establishment of the Federal Coordinating Council for Science, Engineering, and Technology.

2. As time passes, attention in the Executive Office is focused on other problems and the unsensational scientific and technical coordinating body, with little "clout," is transferred out of the Executive Office. This was the case in 1950 and again in 1973 when the Interdepartmental Committee on Scientific Research and Development and the Federal Council for Science and Technology were transferred to the National Science Foundation.

3. The coordinating effort proceeds at this lower level until another attempt is made to upgrade the process by re-establishing another scientific and technical coordinating body at the Presidential level. This was the case in 1959 when the Federal Council for Science and Technology was established and again in 1976, when the Federal Coordinating Council for Science, Engineering, and Technology was formed.

For the third time since 1947, a new scientific and technical coordinating body has been established in the Executive Office of the President. Will the new Federal Coordinating Council follow the spiral course of its predecessors? It is hoped that this history and the forthcoming hearings will be instructive in helping the Council to be a more effective body.

Figure 1

FULL CIRCLE

- ICSRD: Interdepartmental Committee on Scientific Research and Development
- FCST: Federal Council for Science and Technology
- FCCSET: Federal Coordinating Council for Science, Engineering, and Technology

III. COORDINATION OF FEDERAL SCIENTIFIC AND TECHNICAL ACTIVITIES BEFORE THE ESTABLISHMENT OF THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

SCIENTIFIC COORDINATING BODIES (1916-1946)

The Federal Council for Science and Technology is only the most recent in a succession of efforts to coordinate Federal scientific activity. A. Hunter Dupree's *Science in the Federal Government*¹ contains details of various coordinating bodies, from the era when Federal scientific activity was carried on at a much smaller scale.

Going back to the World War I period, an act of August 1916 created a Council of National Defense, composed of the Secretaries of War, Navy, Interior, Agriculture, Commerce and Labor Departments to "coordinate industries and resources for the national security and welfare."² In February 1917, recognizing that it needed assistance, the Council of National Defense requested the newly-formed National Research Council (NRC) to be responsible for "the organization of scientific investigation bearing on the national defense and on industries affected by the war."³ Despite certain limitations, the National Research Council contributed an important service by functioning "as a clearinghouse of information and a focus of scientific personnel."⁴ The NRC was made a permanent institution of the National Academy of Sciences by Executive Order in May 1918 and one of its assigned functions was "to promote cooperation in research, at home and abroad, in order to secure concentration of effort, minimize duplication, and stimulate progress . . ."

After the end of the war, the National Research Council established a Division of Government Relations to continue contacts with the Government and in December 1919, the President appointed a representative from each bureau of the government involved in science to the Division. Apparently, the Division never really became active during the post-World War I period, for NRC reports contained scant information concerning it.⁵

The next important coordinating effort was undertaken as the international situation worsened in the late 1930's and the United States began to prepare the Nation's defenses against the possibility of war with the Axis powers. In 1940 President Roosevelt established the National Defense Research Committee (NDRC) whose purpose was to contract with universities and industrial firms for necessary weapons research. A year later, the NDRC became part of a broader Office of Scientific Research and Development (OSRD) which was

¹ Dupree, A. Hunter. *Science in the Federal Government; a History of Policies and Activities to 1940*. Cambridge, Belknap Press of Harvard University Press, 1957. 460 p.

² *Ibid.*, p. 305.

³ *Ibid.*, p. 312.

⁴ *Ibid.*, p. 323.

⁵ *Ibid.*, p. 330.

established in the Executive Office of the President by Executive Order 8807 of June 28, 1941.

The OSRD was composed of two main components: a reconstituted NDRC for weapons research and development and a new Committee on Medical Research. One of the functions assigned to the OSRD was that of coordinating, aiding, and where desirable, supplementing the experimental and other scientific and medical research activities relating to national defense carried on by the Departments of War and Navy and other Federal departments and agencies.⁶

The Executive Order creating OSRD also created within it an advisory Council consisting of the Chairman of the National Advisory Committee for Aeronautics, the Chairman of the National Defense Research Committee, the Chairman of the Committee on Medical Research, and one representative each from the Army and Navy, to be designated by the respective Secretaries. The function of the Council was to "advise and assist the Director with respect to the coordination of research activities carried on by private and governmental research groups and . . . facilitate the interchange of information and data between such groups and agencies."⁷

Thus, the function of the Council was to advise and assist the Director in the overall coordination of the activities of the two constituent committees (NDRC and Medical Research) each of which was also a coordinating body within its assigned area.

Subsequently, it was found necessary to form yet another coordinating body, this one a Joint Committee on New Weapons and Equipment reporting to the Joint Chiefs of Staff and consisting of the Director, OSRD, and an Army and Navy member. This committee was charged with coordinating the development and production of new weapons and equipment by both civilian research agencies and the armed services. The history of these activities shows a record of achievements but also some difficulties.⁸

RECOMMENDATIONS FOR FEDERAL SCIENTIFIC COORDINATION AFTER WORLD WAR II

Coordination of Government scientific activity was addressed in three important reports of the post-World War II period.

KILGORE REPORT

The first was a report of the Subcommittee on War Mobilization of the Senate Committee on Military Affairs on "The Government's Wartime Research and Development, 1940-44."⁹

The report referred to the "elaborate" system of formal committees, supplemented by informal contacts, which had been established to coordinate the Government's scientific activities. It noted that this coordination would end with the coming of peace, and expressed the opinion that a more permanent mechanism must be worked out in order to achieve a "balanced postwar program of Federal research."

⁶ E.O. 8807, sec. 2c.

⁷ *Ibid.*, sec. 6.

⁸ Baxter, James P., 3rd. *Scientists against time*. Boston, Little, Brown and Co., 1946. 473 p. Chapter 2:
⁹ U.S. Senate. Committee on Military Affairs. Subcommittee on War Mobilization. *The Government's Wartime Research and Development, 1940-44*. Washington, U.S. Govt. Print. Off., Part I, January 1945, 326 p.; Part II, July 1945, 14 p. (the Kilgore Report).

There followed a discussion of the functions of coordination, how it might be attained, and its scope:¹⁰

The chief function of coordination should be (1) to insure that the most important problems are receiving adequate attention; (2) to make possible the best matching of such problems with scientific workers and facilities; (3) to make significant findings available to all interested investigators as rapidly as possible.

Such coordination will arise from a mutual exchange of information on problems, men, facilities, and findings. It cannot be accomplished by decree but by mutual understanding. Where exchange of information and mutual discussion does reveal the need for definite action to achieve more efficient coordination of activity, final responsibility to assure that necessary action is taken should rest with a central scientific agency or with an over-all supervisory agency such as the Bureau of the Budget.

The scope of such coordination should be the whole range of Federal scientific activity. This in turn should be balanced with private activity through cooperative mechanisms and the advisory participation of leading scientists and administrators from private institutions.

The report concluded with a statement of the need for a central scientific agency of the Government, concerning which draft legislation had been prepared, one of whose functions would be to "provide for an efficient formulation and coordination of all . . . federally supported research and development work, utilizing so far as possible the existing resources of public and private research organizations, particularly nonprofit educational institutions and research foundations."¹¹ The legislation referred to was S. 1287, sponsored by Senators Harley M. Kilgore (W. Va.) and Edwin C. Johnson (Colo.) of the Military Affairs Committee and Senator Claude Pepper (Fla.) of the Senate Commerce Committee, to establish a National Science Foundation.

BUSH REPORT

The second discussion of the need for coordination was in the report of a Committee on Science and the Public Welfare to Dr. Vannevar Bush which was included in his report, "Science, The Endless Frontier."¹² In addition to recommending the creation of a National Research Foundation, the Committee made several suggestions for reform in the Federal science structure, among them, in coordination. The relevant paragraphs are excerpted below:¹³

3. COORDINATION OF GOVERNMENTAL RESEARCH

The extensive development of the sciences in recent years, and the increasing complexity of governmental research, make it more difficult each year to coordinate the scientific

¹⁰ Ibid, Part II, p. 11.

¹¹ Ibid, p. 14.

¹² Bush, Vannevar. *Science: The Endless Frontier: a Report to the President*, Washington, U.S. Govt. Print. Off., 1945. 184 p. Appendix 3 (Report of the Committee on Science and the Public Welfare (the Bowman Report)).

¹³ Ibid, pp. 98-99.

work conducted by the Government and to integrate governmental research with that of universities, endowed institutions, and industrial organizations. Parallel investigations of certain important research problems are to be encouraged rather than avoided, and duplication should not necessarily be the bugbear in science that it is in other types of governmental activity. Nevertheless, it becomes increasingly important that the research personnel of various governmental bureaus keep in close touch with one another and with current technical developments and public needs.

a. Coordination of research within the Government

A specific need is for an interbureau committee or council of representatives of the principal scientific bureaus. Such a committee might be set up under the Bureau of the Budget, or other appropriate auspices, to advise on interrelationships of research programs of the different agencies, and to compare the effectiveness of different procedures for administering governmental research. Recommendations from such a committee on policies of budget procedure or of classification of scientific personnel should carry more weight than the recommendation of a single bureau.

The practice of utilizing scientific employees of one bureau as consultants for other bureaus is difficult under existing regulations. But if this practice were generally adopted, it would further coordination of research programs by disseminating more widely a knowledge of the related problems under investigation by various agencies and of the different methods by which these problems are being attacked.

b. Coordination of governmental research with outside organizations

There is a widespread impression that a research project, once started by a Government bureau, may continue long after it has served its original purpose. Research projects need continuous reappraisal in the light of scientific advance and technological developments. Orderly revision of research programs should be the normal and expected result of scientific progress. The danger that a research bureau may fail to revise its programs or its methods when they become obsolete is minimized most surely by encouraging members of the scientific staff to maintain close contact with their professional colleagues elsewhere. . .

Note that whereas the Kilgore report appeared to vest coordinating responsibility in a central scientific agency (National Science Foundation), the Bush report favored "an interbureau committee or council of representatives of the principal scientific bureaus."

The establishment of a Federal research agency which would focus on the promotion of research in the basic sciences and on scientific education and also "coordinate and control diverse scientific activities now conducted by the several departments and agencies of the Federal Government" was endorsed by President Harry S. Truman in a special message to the Congress of September 6, 1945.¹⁴

¹⁴ U.S. President. Public Papers of the Presidents, Harry S. Truman, 1945. Washington, U.S. Govt Print. Off., 1945, pp. 292-294.

STEELMAN REPORT

Meanwhile, as legislation to create a National Science Foundation moved slowly in Congress, a third group was established to look broadly at the Federal scientific program. This was the President's Scientific Research Board, established by Executive Order in October 1946 under the Director of War Mobilization and Reconversion, Dr. John R. Steelman. In the first of five reports issued between August and October 1947,¹⁵ a number of inter-related needs relating to coordination of the Federal research and development program were identified:¹⁶

1. An over-all picture of the allocations of research and development functions among the Federal agencies, and the relative emphasis placed upon fields of research and development within the Federal Government must be available.

2. A central point of liaison among the major research agencies to secure the maximum interchange of information with respect to the content of research and development programs and with respect to administrative techniques must be provided.

3. There must be a single point close to the President at which the most significant problems created in the research and development program of the Nation as a whole can be brought into top policy discussions.

The Steelman report noted that the Office of Scientific Research and Development had served as the over-all instrumentality for the coordination of scientific research and development and had mobilized the Nation's scientific resources, but that its liquidation in 1947 had left an unfilled "gap." Nor could other bodies such as the newly-established Research and Development Board in the National Military Establishment be expected to coordinate the entire national science program.

To fill the gap, the Steelman report recommended three actions.¹⁷ The first was that an Interdepartmental Committee for Scientific Research be created, to meet the need for having a central point of liaison among the major research agencies. The Committee should consist of officials within the departments and agencies concerned with scientific research and development and other officials with a direct interest in science as it related to their broader agency missions.

It was proposed that the Committee have a rotating chairmanship, a Presidentially-designated executive secretary from the White House staff, and that additional staff assistance be provided by the agencies represented on the Committee or subcommittees it might create.

The Steelman report saw the broad role for the Interdepartmental Committee as an instrument through which "the scientific intelligence now available within the Federal departments and agencies can be brought to bear upon maintenance of balance among the several scientific activities of the Government, and the closing of gaps in the present programs".¹⁸ Although noting that the Com-

¹⁵ U.S. President's Scientific Research Board, *Science and Public Policy*, Washington, U.S. Govt. Print. Off., 1947: Vol. 1, *A Program for the Nation* (Aug. 27, 1947, 73 p.); Vol. 2, *The Federal Research Program* (Sept. 27, 1947, 318 p.); Vol. 3, *Administration for Research* (Oct. 4, 1947, 324 p.); Vol. 4, *Manpower for Research* (Oct. 11, 1947, 166 p.); Vol. 5, *The Nation's Medical Research* (Oct. 18, 1947, 118 p.).

¹⁶ *Ibid.*, vol. 1, p. 61.

¹⁷ *Ibid.*, p. 65.

¹⁸ *Ibid.*, p. 66.

mittee would develop its own work program, the report enumerated three administrative problems of immediate concern which should be studied:¹⁹

(1) A full analysis of the relative advantages of contracts and grants as means of supporting research, with recommendations for uniform legislation.

(2) A careful review of the advantages arising from, and the problems connected with, establishment of research coordinating bodies within large Federal agencies.

(3) Means of improving accounting procedures throughout the Federal Government for research and development activities.

Finally, the report noted that the Committee should not be made responsible for either the allocation of functions among the Federal departments or agencies, or for fiscal matters except in very broad terms.

The other two actions relating to Federal organization for science in the Steelman report were that (a) the Bureau of the Budget should set up a unit for reviewing Federal scientific research and development programs, so that an over-all picture of the allocations of research and development programs among the Federal agencies will be available;²⁰ and (b) the President should designate a member of the White House staff for scientific liaison, to provide a single point close to the President who can bring the most significant research and development problems into top policy discussions.²¹

In making a case for an Interdepartmental Committee on Scientific Research, the Steelman report (dated August 27, 1947) made no mention of prior efforts which had been made to establish such a committee by legislation (S. 526) or of President Truman's veto of August 6, 1947, of this legislation which would have created a National Science Foundation and an Interdepartmental Committee on Science. The President's objection to the Interdepartmental Committee was that it would consist of agencies which are responsible to the President but would be chaired by the Director of the Foundation, a man who, under the organization contained in S. 526, would not be appointed by the President or be responsible to him.

ESTABLISHMENT OF INTERDEPARTMENTAL COMMITTEE ON SCIENTIFIC RESEARCH AND DEVELOPMENT

Subsequent modifications in the Interdepartmental Committee's structure recommended by the Steelman report—among them, that the chairman be selected from and rotate among the members—made the Committee acceptable to President Truman. On December 24, 1947, he signed Executive Order 9912 establishing the Interdepartmental Committee on Scientific Research and Development (ICSRD). In composition, procedure, and functional assignments, the ICSRD followed the recommendations in the Steelman report, and, in fact, the statement by the President accompanying the execu-

¹⁹ Loc. cit.

²⁰ The Budget of the United States Government for Fiscal Year Ending June 30, 1948 contained new functional classifications, and among them was a new category "Education and General Research" (See Part IV, pp. 1353-1355). The first special analysis of total Federal research and development expenditures appeared as Special Analysis II in the Budget of the United States Government for the Fiscal Year Ending June 30, 1955, at pp. 1157-62.

²¹ The President designated Dr. John R. Steelman to provide the liaison functions in the statement of December 24, 1947, accompanying Executive Order 9912.

tive order credited the report with emphasizing the need for such a committee. The statement noted that the survey [of the Board] had pointed out "there is no central group equipped to advise on the relationships among the numerous and complex Federal scientific activities, or to take leadership in the solution of administrative problems common to different agencies." Because of the relationship of the Federal research program to the national welfare, and because of the "great sums" annually spent for research by the Government, the establishment of the Committee was termed "a matter of national importance."²²

Table 1 is a comparison of the recommendations of the Steelman report and the provisions of Executive Order 9912 which established the ICSRD.

TABLE 1

STEELMAN REPORT RECOMMENDATIONS	E.O. 9912, DEC. 24, 1947
<i>Name.</i> Interdepartmental Committee for Scientific Research.	Interdepartmental Committee for Scientific Research and Development.
<i>Membership.</i> Officials of agencies most deeply involved in scientific research and development, such as:	Official designated by head of following agencies and such others as President may determine hereafter:
Director, Geological Survey (Interior).	Department of Interior.
Agricultural Research Administrator (Agriculture).	Department of Agriculture.
Director, National Bureau of Standards (Commerce).	Department of Commerce.
Director of Aeronautical Research (NACA).	National Advisory Committee for Aeronautics.
Director, National Institute of Health (FSA).	Federal Security Agency.
Director of Research, Atomic Energy Commission.	Atomic Energy Commission.
Appropriate representation from research activities of National Military Establishment.	Department of Army, Navy, and Air Force and National Military Establishment.
Also members from agencies with direct interest in science, such as:	Veterans' Administration.
Department of State. Civil Service Commission. Director, National Science Foundation.	Smithsonian Institution.

²² Text of statement and Executive Order 9912 are found in Appendix A.

STEELMAN REPORT

RECOMMENDATIONS—continued

E.O. 9912, DEC. 24, 1947—continue

Chairman: Rotate among member agencies. Designated annually by the President.

Executive Secretary: To be designated by the President from White House staff. [In statement accompanying E.O. 9912: Assistant to President, John R. Steelman, designated to provide liaison between President and committee and scientific community].

Additional staff assistance: Member agencies. Federal agencies requested to furnish assistance and information.

Authority to create subcommittees: Yes. Chairman may establish subcommittees; members may include persons other than from member agencies.

Areas for committee action: Maintaining balance among Federal scientific activities; attention to gaps in present programs; studies of certain administrative problems: Recommend actions to make Federal R&D programs most effective in promotion of national welfare.

Grants and contracts; Federal agency coordinating bodies for research; and accounting procedures for R&D Study and recommend changes in administrative policies, procedures, practices:

Grants and contracts.

Personnel policies.

Encourage collaboration among Federal R&D agencies.

Recommend means to improve dissemination of scientific and technical information.

Obtain advice of persons outside Government on matters of concern to Committee.

Perform such other duties as President may prescribe.

Executive Order 9912 assigned a more important role to the ICSRD than the Steelman report had recommended in the charge to the Committee to "recommend steps to make the research and development programs of the Federal Government most effective in the promotion of the national welfare." (Section 3(a)). Whereas the bulk of the duties related to improving the policy for science, this one was directed to improving the use of science in public policy.

There are many similarities between the ICSRD and the Federal Council for Science and Technology which succeeded it. These will be treated below. A significant difference we would note here is that the charter of the Federal Council did not include the broad charge made to the ICSRD by section 3(a) above.

SUMMARY OF ICSRD OPERATIONS

There is little in the public record concerning the ICSRD during the more than a decade of its existence. References to it appear four times in the Federal Register—in the executive orders of 1947 and 1959 which established and abolished it respectively, and in two other executive orders in 1950 and 1954. Its existence was not noted in the *U.S. Government Organization Manual* until after it had been abolished, when it was then included in Appendix A, along with other governmental units which have been abolished, terminated, or transferred since March 4, 1933. A 1956 National Science Foundation report on Federal science organization included the ICSRD on an organization chart of the Executive branch in equal proximity to the President and Executive Office units as the Civil Service Commission and the General Services Administration.²³ However a follow-on NSF report on "Advisory and Coordinating Mechanisms for Federal Research and Development, 1956-57" (Washington, U.S. Govt. Print. Off., 1957. NSF 57-13) gave the Committee a mere two paragraphs in a position next to the last entry in the 27-page document.

The following summary is a consolidation of information about the ICSRD in the public record.

The ICSRD was organized in February 1948. Dr. Alexander Wetmore, Secretary of the Smithsonian Institution, was appointed the first Chairman; Dr. Thomas B. Nolan, Assistant Director of the Geological Survey, Department of the Interior, was appointed Vice-Chairman. Other members of the Committee were:²⁴

Dr. James B. Fisk, Director, Division of Research, Atomic Energy Commission;

Dr. E. U. Condon, Director, National Bureau of Standards;

Miss Mary E. Switzer, Assistant to the Administrator, Federal Security Agency;

Dr. Hugh L. Dryden, Director of Aeronautical Research, National Advisory Committee for Aeronautics;

Dr. W. V. Lambert, Research Administrator, Department of Agriculture;

Dr. J. E. Graf, Assistant Secretary, Smithsonian Institution, deputy for Chairman Wetmore;

Dr. E. H. Cushing, Assistant Medical Director for Research and Education, Veterans' Administration;

Maj. Gen. Henry S. Aurand, Director of Service, Supply and Procurement of General Staff, Department of the Army;

Maj. Gen. A. C. McAuliffe, Deputy Director for Research and Development, Department of the Army, deputy for General Aurand;

Maj. Gen. L. C. Craigie, Director of Research and Development, Department of the Air Force;

Dr. Lawrence R. Hafstad, Executive Secretary, Research and Development Board, National Military Establishment; and

Rear Adm. P. F. Lee, Chief of Naval Research, Department of the Navy.

In general, the ICSRD membership consisted of research directors of the constituent agencies.

²³ U.S. National Science Foundation. *Organization of the Federal Government for Scientific Activities*. Washington, U.S. Govt. Print. Off., 1956. 319 p. At p. 18; also pp. 326-327.

²⁴ Wetmore to Head Research Board. *New York Times*, Feb. 15, 1948, p. 52.

The ICSRD was mentioned in the March 1949 report of the Commission on the Organization of the Executive Branch of the Government (the First Hoover Commission) on Federal research.²⁵ The Commission noted that the Federal Government was engaged in a wide range of research activities involving "tremendous" expenditures of funds; in 1947 these expenditures, excluding atomic energy, had totalled \$625 million. Although recognizing the major importance of effective planning and coordination of research, the Commission had not made an independent study of the Federal organization for research because this had been done recently by the President's Scientific Research Board. Nevertheless, the Commission wished to call attention to "major issues" in this field, to what had been done, and to what remained to be done. The remainder of the report was addressed to the need for both intradepartmental and overall coordination of research, and for the creation of a National Science Foundation.

The Commission noted that the Interdepartmental Committee on Scientific Research and Development had been established in 1947 "to further the most effective administration of scientific research and development activities in the Federal Government" and that it had been authorized "to submit recommendations on research policy and administration directly to the President."²⁶ However, after more than a year in existence, the Commission expressed the opinion that "the full potentialities of this committee [ICSRD] have not been realized since its members have not as yet attacked major problems of research policy for the Federal Government as a whole. This may be due in part to lack of staff and funds. An interdepartmental committee working alone and without staff is seriously limited in achieving adequate coordination and in developing over-all plans to completion. This points to the need for a National Science Foundation."²⁷ The balance of the report contained a justification for a National Science Foundation and concluded with two recommendations:

(a) Authority be granted to the President to coordinate research, and to strengthen interdepartmental committee organization for this purpose.

(b) A National Science Foundation be established.²⁸

On June 1, 1949, the first full-time executive secretary of the ICSRD was appointed, reportedly in partial response to the Hoover Commission's recommendation to strengthen interdepartmental coordination of research.²⁹ This position was financed successively by several different agencies. Beginning with fiscal year 1951, the Department of State and the newly-established National Science Foundation were added to the membership. The latter agency also took over support of the Interdepartmental Committee³⁰. NSF annual reports show obligations for support of the Interdepartmental Committee for this early period as follows: FY 1951, \$26,101; FY 1952, \$18,755; FY 1953, \$23,272.

²⁵ U.S. Commission on the Organization of the Executive Branch of the Government. Overseas Administration; Federal-State Relations; Federal Research; A Report to the Congress. Washington, U.S. Govt. Print. Off., March 1949, pp. 43-50.

²⁶ *Ibid.*, p. 49.

²⁷ *Loc. cit.*

²⁸ *Ibid.*, p. 50.

²⁹ E. W. Scott Gets Science Liaison Post, Washington Post, May 26, 1949, p. 2.

³⁰ U.S. National Science Foundation. First Annual Report, 1950-51. Washington, U.S. Govt. Print. Off. [1951].

A former member later described the Interdepartmental Committee's scope as having dealt primarily with "general administrative matters, personnel matters, facilitating the scientific research of the agencies."³¹

Examples of ICSRD activity included studies related to the recruitment and retention of scientific personnel,³² budgetary procedures, selective service,³³ policies and procedures for the use of grants and research contracts, including recommendations for publication of research reports as part of research costs³⁴ and an inventory of major scientific facilities of the Government with a view for their possible sharing by various agencies. This latter activity was undertaken in response to section 8 of Executive Order 10521 of March 17, 1954, which was directed toward the efficient use of research equipment and facilities of the Federal agencies. The Interdepartmental Committee was directed to "take necessary steps to ensure that each Federal agency engaged directly in scientific research is kept informed of selected major equipment and facilities which could serve the needs of more than one agency." A 1955 inventory was augmented by a supplement in 1957.³⁵

Executive Order 10096 of January 23, 1950, which provided for a uniform patent policy for the Government with respect to inventions made by Government employees and a Government Patents Board to advise on the implementation of the policy, also directed the Board's Chairman and the Chairman of the Interdepartmental Committee to "establish and maintain such mutual consultation as will effect the proper coordination of affairs of common concern." No further details of this activity were found.

TERMINATION OF THE ICSRD

The unexpected and successful launch of the Soviet Sputnik in October 1957 was widely interpreted as a threat to the relative position of the United States vis-a-vis the Soviet Union. Shortly thereafter, the findings of a classified report of the Security Resources Panel³⁶ to the President revealed a frightening picture of the potential threat to the United States from the military supremacy of the Soviet Union.

In recognition of his need for scientific and technical advice at first hand, in November 1957, President Dwight D. Eisenhower appointed James R. Killian, Jr., President of MIT, to be a Special Assistant for Science and Technology and to serve as his science adviser. He also transferred the Science Advisory Committee from the Office of Defense Mobilization and reorganized it as the President's Science Advisory

³¹ Testimony of Dr. Hugh Dryden of NACA in U.S. Congress. Senate. Committee on Aeronautical and Space Sciences. "Investigation of Governmental Organization for Space Activities. Hearings before the Subcommittee on Governmental Organization for Space Activities, March-May 1959. 86th Congress 1st session. Washington, U.S. Govt. Print. Off., 1959, p. 76.

³² See National Science Foundation Sixth Annual Report, Fiscal Year 1956, for review of Committee activity, "Recruiting and retaining scientific personnel in Government service," pp. 20-21.

³³ The Hafstad Report. Memorandum to Mr. W. Stuart Symington, Chairman National Security Resources Board. Bulletin of the Atomic Scientists, v. 6, December 1950, pp. 379-380.

³⁴ U.S. Interdepartmental Committee on Scientific Research and Development. Report on Grants and Research Contracts. Washington, December 1950, 25 p. [Published at Oak Ridge, Tenn. by the Atomic Energy Commission.]

³⁵ This inventory is mentioned in the report of the Subcommittee on Science, Research, and Development of the House Committee on Science and Astronautics, entitled Utilization of Federal Laboratories, 90th Congress, 2d session. 1968, p. 14. According to Dr. Allen V. Astin, former Director of the National Bureau of Standards, "little or no use was ever made of the information."

³⁶ U.S. Office of Defense Mobilization. Science Advisory Committee. Deterrence and Survival in the Nuclear Age. Report of the Security Resources Panel [the Gaither Report]. Completed in November 1957; portions unofficially released December 1957; made public January 10, 1973.

Committee (PSAC). An initial assignment to the Committee was to make a study of what the Federal Government could do to "underwrite the strength of American science and technology as one of our essential resources for national security and welfare."³⁷

Little is known about the activities of the ICSRD during this period and throughout 1958. The National Security Council coordinated defense-related issues and when the National Aeronautics and Space Administration was established in July 1958, Congress also established a National Aeronautics and Space Council, intended to coordinate these activities.

The ICSRD was not sufficiently high-level to perform coordinating functions at the policy level. This was in fact stated when the Panel on Research Policy of the President's Science Advisory Committee reported at the end of December 1958 on its assignment of a year earlier. The Panel's report, *Strengthening American Science*, observed that the Government's role as administrator of a vast and highly diversified research and development effort is a task of "almost incredible complexity." Given the dimensions and complexity of the task, the report said it is not surprising that the goal of managing the Government research and development programs in the most effective manner had not yet been attained. A brief discussion followed of attempts in the past to relate the research and development activities of the various agencies to each other and to research carried on outside the Government. After commenting on the role of the National Security Council and the Operations Coordinating Board in formulating national policies in specific areas, and that of the National Science Foundation in the development and recommendation of national policies for the promotion of basic research and science education, the report turned to the ICSRD:³⁸

... The Interdepartmental Committee on Scientific Research and Development also has constituted a useful mechanism for the exchange of information among research and development agencies and has been a source of policy recommendations dealing principally with scientific and technical personnel problems and the administration of Federal laboratories. But these attempts have had limited objectives and the fundamental problem remains unsolved. Each agency and department continues to formulate its own policies in science and technology with insufficient reference to the policies of others. Without in any way encroaching upon the freedom and authority of each department or agency to manage its own programs, there is still an opportunity to pull together the policies developed in different agencies of the Government with a view to integrating and reconciling them as a whole.

To perform this integrative role, the PSAC panel recommended the creation of an interagency council "to promote coordinated policy planning and more effective management of Federal programs in science and technology."³⁹ Included in the Panel's recommendations

³⁷ Statement by the President accompanying the report of the President's Science Advisory Committee, "Strengthening American Science," Washington U.S. Govt. Print. Off., December 1958, 36 p. at p. 1.

³⁸ Strengthening American Science, Ibid, pp. 10-11.

³⁹ Ibid, pp. 28-30.

were the proposed functions, membership, and other details concerning the council, to be known as the Federal Council for Science and Technology. Another series of recommendations dealt with strengthening the administration and utilization of Government laboratories.

The PSAC Panel did not envisage the Federal Council for Science and Technology to replace the ICSRD. In a section of the report on implementation, along with a recommendation to assure the continuing responsibility of the National Science Foundation for developing policies for the promotion and support of basic research and education in the sciences, the Panel recommended that "provisions of Executive Order 10521, and Executive Order 9912, which established the Interdepartmental Committee on Scientific Research and Development, should be reviewed to ensure that they are consonant with the responsibilities of the council."⁴⁰

Approximately three months elapsed between the President's statement accompanying the PSAC report, in which he approved establishment of the Federal Council and directed that an implementing Executive order be prepared "without delay", and the issuance of Executive Order 10807 on March 13, 1959. Two major difficulties in preparing the implementing Executive order were determining the membership of the new Council and reconciliation by Bureau of the Budget personnel of previous Executive orders with the new one.⁴¹ This latter reconciliation, with its time-consuming legal and jurisdictional complexities, was reported to be the major procedural problem faced by those concerned with the order.⁴²

The issue concerning the ICSRD was resolved in Executive Order 10807 which established the Federal Council for Science and Technology. Section 6(a) of the Executive order revoked Executive Order 9912 of December 24, 1947, which had established the Interdepartmental Committee on Scientific Research and Development. However, Section 4 of the new order, which authorized the establishment of standing committees, directed the establishment of "at least one such standing committee . . . composed of scientist-administrators representing Federal agencies, [which] shall provide a forum for consideration of common administrative policies and procedures relating to Federal research and development activities and for formulation and recommendations thereon, and . . . such other related functions as may be assigned to it by the Chairman of the Council." Thus, provision was made for the creation of a new committee under the Federal Council to assure continuation of activity at the administrative level, which had been the focus of the Interdepartmental Committee on Scientific Research and Development.

EVALUATION OF ICSRD

There appears to be general agreement from the information in the public record that the Committee performed a useful and necessary role.

Its creation, which coincided with the formal termination of the Office of Scientific Research and Development of World War II, provided an instrument through which the President was able to

⁴⁰ *Ibid.*, p. 30.

⁴¹ News of Science. Science Advisory Committee's Recommendation for Science Council Being Implemented by Executive Order, Science, v. 120, March 13, 1959, pp. 708-709.

⁴² *Loc. cit.*

focus the collective attention of major science-oriented departments and agencies on common problems relating to their research and development programs. Until the National Science Foundation was established in 1950 and became operational, the ICSRD was the only governmental unit which was charged with the broad function of making research and development programs more effective in the national welfare, and thus melding the missions of the constituent agencies toward common objectives.

Both the National Science Foundation Act of 1950 and Executive Order 10521 of March 17, 1954, assigned to NSF functions which overlapped with those of the ICSRD. Among these were the functions assigned to the Foundation by section 3(a) (5) and (6) of the Act relating to interchange of scientific information and to evaluation of the scientific research programs of Federal agencies; and section 3 of Executive Order 10521, which directed that the Foundation "in concert with each Federal agency concerned, shall review the scientific research programs and activities of the Federal Government in order . . . to formulate methods for strengthening the administration of such programs and activities by the responsible agencies. . . ."

An interagency committee is only as strong as the backing it receives from its constituent member agencies or the central direction under which it operates. The transfer in 1951 of the ICSRD to the National Science Foundation, a new agency whose budget did not exceed \$15 million until fiscal year 1957, enabled it to survive, but the shift may have impeded its ability to deal with much larger agencies.

During its entire existence, the ICSRD maintained a low profile. It issued few reports and these were not widely distributed.⁴³ Its existence was not noted in the *U.S. Government Organization Manual* until after it had been abolished. An NSF report, *Advisory and Coordinating Mechanisms for Federal Research and Development, 1956-57* (Washington, U.S. Govt. Print. Off., 1957. NSF 57-13), gave the Committee a mere two paragraphs in a position next to the last entry in the 27-page document.

Probably the most informed evaluation of the ICSRD is that by John C. Honey, an NSF employee, who had directed the Foundation's 1956 study of Federal organization for science:⁴⁴

The Interdepartmental Committee for Scientific Research and Development was established by Executive Order in 1947. Its membership is made up of persons designated by the heads of the principal departments and agencies having research and development activities. Its secretariat is located in the National Science Foundation. Among other duties, it is directed to recommend steps to make the Government's research programs more effective in promoting the national welfare; to make recommendations on administrative policies and procedures affecting Federal research; and to study and report on current policies and administrative practices related to Federal support of research.

⁴³ No reports of the ICSRD were found in the main collections of the Library of Congress.

⁴⁴ Honey, John C. *Federal Government Organization and Programs for Research and Development—An Overview*. Federal Bar Journal, v. 17, July-September 1957, pp. 216-227. At p. 220.

In practice the ICSRD has concerned itself largely with administrative problems affecting Federal research. It has tended not to be a policy forum, in part, because its policy responsibilities as stated in the Executive Order which created it are so similar to those of the National Science Foundation as to have led at certain times to a sense of competition between the two organizations. There has perhaps, too, been a tendency on the part of some research officials who wish to keep science policy development decentralized in the hands of the individual agencies to play off the ICSRD and the NSF against one another.

The ICSRD is an illustration of how an organizational response to the needs of one decade was found inadequate in another decade because of subsequent organizational responses to other needs and because of changing times.

IV. THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY FROM ITS ESTABLISHMENT UNTIL THE CREATION OF THE OFFICE OF SCIENCE AND TECHNOLOGY (1959-1962)

On March 13, 1976, the Federal Council for Science and Technology had been in existence for seventeen years. Its legislative basis was Executive Order 10807, signed by President Dwight D. Eisenhower, in the last two years of his term in office. Any one of the four Presidents who have succeeded him could have abolished the Federal Council merely by issuing another Executive order, but no one did. Seven Presidential science advisers have served as Chairman of the Federal Council. All have recognized the necessity of having such a top-level coordinating body and have expressed a desire and intention to try to make the Council a stronger and more effective body.

The signing of the National Science and Technology Policy, Organization and Priorities Act of 1976 (P.L. 94-282) on May 11, 1976, ended another chapter in the continuing effort to provide for effective interagency coordination of Federal scientific and technical activities. The Federal Council as established by Executive order was abolished. In its place a Federal Coordinating Council on Science, Engineering and Technology has been established to be under the chairmanship of the Director of the new Office of Science and Technology Policy in the Executive Office of the President, and to perform enumerated and such other related advisory duties as the President or the chairman shall assign. It is the hope and expectation that this action will enable the Federal Coordinating Council to effect any necessary reorganization, without losing continuity.

With a legislative basis, the Federal Coordinating Council on Science, Engineering and Technology will be a joint executive-legislative product and responsible in certain measure to both.

The projected hearings of the Domestic and International Scientific Planning and Analysis Subcommittee of the House Committee on Science and Technology on the Federal Council will be occurring as the new Executive Office science advisory units are getting organized. In order to be able to make constructive suggestions about a future role for the Council, the subcommittee will need an understanding of the Council's past history. The previous section included considerable detail about the Interdepartmental Committee for Scientific Research and Development, the predecessor agency to the Federal Council. In the sections which follow, the Federal Council's activities will be reviewed in three time periods: (1) from its establishment in 1959 until the creation of the Office of Science and Technology in 1962, serving in an advisory capacity to the President; (2) as a coordinating body in the Executive Office of the President closely aligned with the Office of Science and Technology, whose Director was responsible to

Congress, from 1962 to 1973; and (3) as a coordinating body located in the National Science Foundation, one of its constituent agencies, from 1973 to the present.

This section focuses on the establishment and early years of the Federal Council. It contains considerable detail concerning the events which led up to the issuance of Executive Order 10807, because, as noted above, this Executive order is the basis for the statutory authority of the new Federal Coordinating Council for Science, Engineering and Technology.

POST-SPUTNIK ACTIVITIES TO STRENGTHEN AMERICA'S SCIENTIFIC AND TECHNICAL CAPABILITY

The Federal Council for Science and Technology was established in March 1959 in an atmosphere of cautious optimism. The near-panic mood of the Nation from the shock to its complacency by the launch of the Soviet Sputnik in October 1957 had calmed. With the appointment in November 1957 of a Special Assistant for Science and Technology and the enlargement, reconstitution, and transfer to the White House of the Science Advisory Committee, a channel for scientific and technical advice became available to the President and units of the Executive Office of the President.

The year 1958 had been the scene of action on many fronts to strengthen the American scientific and technical capability. Presidential science adviser James R. Killian Jr. reviewed some of these efforts in an address of December 29, 1958, at the annual meeting of the American Association for the Advancement of Science.¹

Among them were—

- The more than doubling of the National Science Foundation appropriation to increase its support for basic research and science education;
- Reorganization of research and development in the Defense Department;
- Passage of the National Defense Education Act to strengthen education in the Nation generally including scientific education;
- Establishment of the Office of Science Adviser in the Department of State and the appointment of scientific attaches;
- Creation of NASA and the National Aeronautics and Space Council to provide a civilian space program;
- Work of the President's Committee on Scientists and Engineers to improve the utilization of scientists and engineers;
- Establishment of standing committees in the House and the Senate on Science and Astronautics and Astronautics and Space Science, respectively; and
- Activities of the President's Science Advisory Committee, including its just-published report recommending creation of a Federal Council for Science and Technology.

¹ Report of Dr. James R. Killian, Jr. *In* U.S. Congress. Senate, Committee on Government Operations, Subcommittee on Reorganization and International Organizations, Science Program—86th Congress. Report of the . . . Washington, U.S. Govt. Print. Off., 1959. At head of title: 86th Congress 1st session. Senate Report No. 120, pp. 3-17.

PRESIDENT'S SCIENCE ADVISORY COMMITTEE RECOMMENDS CREATION OF A FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Dr. Killian's review of his first year as Special Assistant to the President for Science and Technology included an extended discussion of the role and functions of the President's Science Advisory Committee (PSAC) and its activity in several areas of civilian science and technology.² He did not touch on its activities in the defense area, which are known to have been extensive. The discussion, although historical since PSAC was abolished in 1973, may be of current interest because of the insights it provided concerning the roles of the Special Assistant and PSAC during their first critical year in a White House advisory capacity. This is the setting in which the Federal Council began its existence. Of further interest are Dr. Killian's comments concerning the recommendations of the PSAC report, *Strengthening American Science*, which recommended the establishment of the Federal Council, on the day after the report was made public.

SPECIAL ASSISTANT FOR SCIENCE AND TECHNOLOGY AND THE PRESIDENT'S SCIENCE ADVISORY COMMITTEE RELATIONSHIPS

President Eisenhower transferred the Science Advisory Committee from the Office of Defense Mobilization to the White House in November 1957. The reconstituted committee included eighteen members, including the Special Assistant.³ The majority of these members were selected from outside the Government to represent fields of science and technology with which the Government was currently involved. However, besides the Special Assistant, the early PSAC included the Director of Research and Engineering of the Department of Defense as a member. Representatives of two other agencies—the Director of the National Science Foundation and the science adviser of the State Department—also sat with the Committee, according to Dr. Killian. In later years, PSAC was entirely made up of experts from outside the Government except for the Special Assistant to the President for Science and Technology, who was always selected by the group as its chairman.

PSAC was organized into panels made up of Committee members and other scientists and engineers from the scientific community. By this means, the Committee was able to utilize and provide a broader spectrum of advice than the Committee alone could have done.

Dr. Killian clarified his role and that of the Science Advisory Committee. He stated that neither the Committee nor he had operational responsibilities; nor did they have responsibility to decide policy. Their function—the Committee's and his—

. . . is to provide answers to questions raised by the President, to undertake assignments for him of an advisory kind, to mobilize the best scientific advice in the country, and make recommendations to him in regard to ways by

² Ibid, pp. 7-14.

³ Twelve of the original eighteen members are still living.

which U.S. science and technology can be advanced, especially in regard to ways by which they can be advanced by the Federal Government and on how they can best serve the Nation's security and welfare. This advisory service, the President has indicated, is available also to members of the Cabinet and other officers of government when they wish it.⁴

Dr. Kellian observed further that a principal function of the Science Advisory Committee was "to provide a communications center for science in the Federal Government and thus to facilitate intercommunication among various scientific activities within government and between the civilian scientific community and the Government."⁵

Dr. Kellian noted that the establishment of an Executive Office science advisory office had stimulated an "extraordinary array of requests within Government to make scientific advice available. The problem has been to avoid being overwhelmed by the many requests for advisory services while at the same time trying to respond helpfully and promptly whenever a need arises."⁶ He did not identify these requests, further but his subsequent discussion of Committee activities in five representative areas indicated which subjects had been the focus of attention to date. These areas were:

Space science.

Scientific information.

Research policy.

Science and technology in foreign affairs, and

Science and engineering education.

Only the activities relating to research policy are discussed below.

"STRENGTHENING AMERICAN SCIENCE"

The report, *Strengthening American Science*, was the work of the PSAC Panel on Research Policy. It had been established in response to a Presidential request in late 1955 to the new Committee to make a study of ways in which the Federal Government could strengthen American science and technology as essential resources for national security and welfare.

The chairman of the Panel was Dr. Emanuel R. Piore, Director of Research, International Business Machines Corporation. Dr. Piore was not a member of PSAC at that time, but five of the members of the Panel were PSAC members. They were:

Dr. Robert F. Barber, Professor of Physics, California Institute of Technology;

Dr. William O. Baker, Vice President (Research), Bell Telephone Laboratories;

Dr. Caryl P. Haskins, President, Carnegie Institution of Washington;

Dr. George B. Kistiakowsky, Professor of Chemistry, Harvard University, and

Dr. Paul A. Weiss, Rockefeller Institute of Medical Research.

The remaining members were: Dr. Albert W. Tucker, Professor of Mathematics, Princeton University, and Dr. Alan T. Waterman, Director, National Science Foundation.

Strengthening American Science was made public December 27, 1955, with an accompanying statement of endorsement by President Dwight Eisenhower in which he called attention to one recommendation in particular—the establishment of a new Federal Council for Science and Technology:⁷

One of the specific recommendations of the report calls for the establishment of a new Federal Council for Science and Technology, a body to promote closer cooperation among Federal agencies in planning their programs in science and technology. I have approved the establishment of this new Council and have asked that the appropriate Executive Order be prepared for bringing it into existence without delay. It is my hope that this new Council will improve the planning and management of Government research programs and will facilitate the resolution of common problems and promote greater interagency cooperation.

The short report (36 pages, approximately 10,000 words) looked broadly at the research and development effort in the Nation and identified problem areas and unmet needs in all sectors of the economy. Within the Federal Government, the report called attention to the need for stability and continuity in research support, for balanced division of effort between basic research, applied research and development for and attention to new areas of science which should receive greater support, such as meteorology, oceanography, and materials.

The existing mechanisms for formulating national policies in specific areas of science and technology were noted—the National Security Council, the Operations Coordinating Board, and the Interdepartmental Committee on Scientific Research and Development. But all these mechanisms have had limited objectives and “the fundamental problem remains unsolved” because:⁸

Each agency and department continues to formulate its own policies in science and technology with insufficient reference to the policies of others. Without in any way encroaching upon the freedom and authority of each department or agency to manage its own programs, there is still an opportunity to pull together the policies developed in different agencies of the Government with a view to integrating and reconciling them as a whole.

The report noted that the existence of a Special Assistant for Science and Technology and the President's Science Advisory Committee had “opened new channels of communication between the White House and the Nation's scientific community, and had offered advice and recommendations vitally affecting public policy both domestic and foreign.” But “still lacking is an effective instrument of government made up of representative Government officers, that can promote closer cooperation among Federal agencies in planning and managing their programs in science and technology and in achieving their coordination.”⁹

⁷ U.S. President's Science Advisory Committee. *Strengthening American Science. A Report of the . . .* Washington, U.S. Govt. Print. Off., 1955, 36 p.

⁸ *Ibid.* p. 10.

⁹ *Ibid.* p. 11.

The suggestion to bring together the departments and agencies into a single department under a Secretary of Cabinet rank was not the answer on several enumerated grounds. What was needed was a way to preserve the individual freedom of the departments and agencies "while encouraging all agencies to meld their individual efforts under broad common policies that seem both reasonable and desirable."

The report suggested that "an instrument of Government for bringing to the Special Assistant to the President for Science and Technology in an organized way, the advice and assistance of policy officials in the major research and development agencies could help immeasurably in developing policies for improving the planning and management of the scientific and technical programs of the Federal Government."¹⁰ Such an instrument could be a new Federal Council for Science and Technology. Creation and definition of such a body became a principal recommendation of *Strengthening American Science*, as a way to improve Government planning and management.

The reports also made recommendations in four other main areas: (1) strengthening Government laboratories (including a recommendation that each department with substantial science and technology responsibilities designate an official to represent the department at the policy level and to represent it on the Federal Council); (2) guidelines for Government-sponsored research in non-Government institutions (including industry, nonprofit institutes, and universities); (3) necessity for adequate capital support for science (including a recommendation that the Federal Council prepare projections of the capital requirements of the Federal agencies); and (4) suggestions for greater private support of research.

DR. KILLIAN'S SUMMARY OF THE REPORT

Dr. Killian's review of 1958¹¹ contained the following summary of the report of the PSAC Panel on Research Policy. Although he discussed first the recommendation with respect to the Federal Council, much of the summary was devoted to the Panel's other recommendations and he reiterated the conclusion of the report that the task of further strengthening American science required the participation and contribution of Government, industry, universities, foundations, and individuals:

Research policy

... the Science Advisory Committee's Panel on Research Policy has just published a report entitled, "Strengthening American Science," which deals with the role of the Federal Government in research and development. The President has directed that an executive order be prepared to carry out the recommendation of the report that a Federal Council for Science and Technology be established to advise the Cabinet on those aspects of the Government's program which require interdepartmental and governmentwide coordination and policymaking and which affect science as a whole. Membership on the Council will include representatives of the departments and agencies which have substantial research

¹⁰ Ibid., p. 12.

¹¹ Report of Dr. James R. Killian, Jr. op. cit.

activities, these representatives to be drawn from the policy-making levels of these departments and agencies. The Council, made up of Government officers, can call for advice from the President's Science Advisory Committee, which draws its members largely from the Nation's scientific and engineering community outside of Government.

While searching for ways to improve public management where it relates to science, the report devotes attention to the nurturing of important new scientific fields and the strengthening of those which are assuming new importance. Meteorology is one example where additional capital funds and emphasis are necessary. Geology, geophysics, oceanography, materials research, radio astronomy, studies of the upper atmosphere, and combustion, are other examples where augmented support and effort are clearly needed.

Government operations increasingly have brought growing demands for the fruits of research and more support for actual work performed. There has been no comparable provision, however, for new instruments and facilities except in certain specialized fields. Capital deficiencies, moreover, are being further aggravated by the rapid progress occurring in the improvement and invention of the instruments of science themselves.

The Panel urges the formulation of thoughtfully conceived policies for the financing and planning of the great multi-million dollar research instruments of modern science, such as particle accelerators for nuclear physics, and of centralized research institutes which are needed or proposed in various fields. We are at a point where we need to bring together the best available judgment from the domains of Government, education, and science to determine how far we should go in the establishment of research institutes and what their relations should be with the universities. Unsound planning might result in weakening the universities and, by drawing away from them too many research scholars, in reducing their capacity to nurture new scholars.

The importance of the role of private support in the Nation's total scientific effort is emphasized. Private foundations are uniquely qualified to provide venture capital to grubstake new ideas and to support men as well as projects.

The growth of Federal support of science in recent years has been marked by some hesitancy on the part of private sources of funds to maintain the level of their contributions to academic and other nonprofit institutions. It would be most unfortunate if this hesitancy were to continue or spread, for there are growing opportunities for private philanthropy to contribute to the strength and freedom of American science. It is vitally important, therefore, that Government science policy does not discourage private support of science, but indeed, that it takes pains to encourage more of it.

In making public yesterday the report of the Science Advisory Committee, the President called particular attention to its conclusion that the task of further strengthening U.S. science is so broad that Government, industry, universities,

foundations, and individuals all have vital roles to play. The future growth of American science will depend upon increased participation and contributions by all of these types of institutions if we are to be equal to the full range of opportunities which lie ahead.¹²

IMPLEMENTATION OF THE PSAC RECOMMENDATION TO ESTABLISH A FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Although the President requested that the Federal Council be brought into existence "without delay", it was another three and a half months before the Executive order implementing the PSAC recommendation was issued. Two main problems had to be solved. One was the membership of the Council; the other was the reconciliation of already existing Executive orders to the new one.¹³ Resolution of these difficulties was handled by Bureau of the Budget personnel, and the final product was reviewed by the Justice Department for possible legal problems which may have been overlooked.

EXECUTIVE ORDER 10807

President Eisenhower signed Executive Order 10807 on March 13, 1959. In an accompanying White House statement, the President said:

I believe that the new Federal Council for Science and Technology can effectively aid the objective of improving the ways in which the Federal Government uses and supports science. Moreover, the report of my Science Advisory Committee on "Strengthening American Science" also pointed to a number of opportunities for advancing our total national program. I expect the new Council to consider and evaluate these opportunities and to encourage all Government agencies further to increase the quality of their efforts in these fields. By fostering greater cooperation among Federal agencies in planning their research and development programs, by facilitating the resolution of common problems, and by reviewing the impact of government policies on the programs of non-governmental institutions, the Council should be able to contribute greatly to the development and advancement of our national programs in these important and critical areas.

Thus, at the same time, he both welcomed the Council and gave it its first assignment—to consider and evaluate the opportunities for advancing our total national program and to encourage all Government agencies to improve their efforts in these fields. The "opportunities" alluded to in the President's statement were those in scientific fields such as meteorology, materials research, oceanography, etc. for which additional support had been urged in the PSAC report.

¹² *Ibid.* pp. 10-11.

¹³ *News of Science: Science Advisory Committee's Recommendation for Science Council Being Implemented by Executive Order.* *Science*, v. 129, March 13, 1959, pp. 708-709.

SECTIONAL ANALYSIS OF EXECUTIVE ORDER 10807

A sectional analysis of Executive Order 10807 in chart form appears below:

Section 1. Establishment of Council

Name: Federal Council for Science and Technology.

Members: (1) Special Assistant to the President for Science and Technology; (2) One representative of policy rank to be named by Secretary of these departments:

Department of Defense.

Department of the Interior.

Department of Agriculture.

Department of Commerce.

Department of Health, Education, and Welfare.

(3) Director, National Science Foundation; (4) Administrator, National Aeronautics and Space Administration; (5) Chairman or another member of the Commission of the Atomic Energy Commission.

Observers: Department of State; Bureau of the Budget.

Chairman: To be designated by the President from time to time from among the members. Chairman to designate members to act temporarily as Chairman.

Participation by other agencies: Chairman may request representation from non-Member or Observer agencies at meetings concerned with matters of substantial interest to those agencies; Chairman may also invite other persons to attend Council meetings.

Meetings: At call of Chairman.

Section 2. Functions of Council

(a) Consider problems and developments in the fields of science and technology and related activities affecting more than one Federal agency or concerning the over-all advancement of the Nation's science and technology, and recommend policies and other measures—

(1) to provide more effective planning and administration of Federal scientific and technological programs,

(2) to identify research needs including areas of research requiring additional emphasis,

(3) to achieve more effective utilization of the scientific and technological resources and facilities of Federal agencies, including the elimination of unnecessary duplication, and

(4) to further international cooperation in science and technology.

In developing these policies the Council, after consultation, as considered appropriate by the Chairman, with the National Academy of Sciences, the President's Science Advisory Committee or other organizations, shall consider—

(i) the effects of Federal research and development policies and programs on non-Federal programs and institutions,

(ii) long-range program plans designed to meet the scientific and technological needs of the Federal Government, including manpower and capital requirements, and

(iii) the effects of non-Federal programs in science and technology upon Federal research and development policies and programs.

(b) Consider and recommend measures for the effective implementation of Federal policies concerning the administration and conduct of Federal programs in science and technology.

(c) Perform such other related duties as shall be assigned, consonant with law, by the President or the Chairman.

(d) Chairman shall, from time to time, submit to the President such of the Council's recommendations or reports as require the attention of the President by reason of their importance or character.

Section 3. Agency assistance to Council

(a) Each Federal agency represented on the Council shall furnish necessary assistance to the Council . . . Such assistance may include (1) detailing employees to the Council to perform such functions . . . as the Chairman may assign to them, and (2) undertaking, upon request of the Chairman, such special studies for the Council as come within the functions herein assigned to the Council.

(b) Upon request of the Chairman, the heads of Federal agencies shall, so far as practicable, provide the Council with information and reports relating to [their] scientific and technological activities . . .

Section 4. Standing committees and panels

Standing committees and panels may be established for the purpose of conducting studies and making reports as directed by the Chairman.

At least one such standing committee shall be composed of scientist-administrators representing Federal agencies, shall provide a forum for consideration of common administrative policies and procedures relating to Federal research and development activities and for formulation of recommendations thereon, and shall perform such other related functions as Chairman of the Council may assign.

Section 5. Security procedures

Chairman shall establish procedures to insure the security of classified information used by or in custody of the Council or employees under its jurisdiction.

Section 6. Other orders; construction of orders

Executive Order No. 9912: (a) Executive Order No. 9912 of December 24, 1947, entitled "Establishing the Interdepartmental Committee on Scientific Research and Development," is hereby revoked.

Executive Order No. 10521: (b) Executive Order No. 10521 of March 17, 1954, entitled "Administration of Scientific Research by Agencies of the Federal Government," is amended—

(1) Sections 1 and 3 are amended to clarify that the responsibility of the National Science Foundation extends to basic scientific research and education in the sciences, rather than to all scientific research.

(2) Paragraph c of section 8 relating to the Interdepartmental Committee on Scientific Research and Development is eliminated.

(3) A new section 10 assigns to the National Science Foundation a leadership role in the effective coordination of the scientific information activities of the Federal Government.

Relationship of Executive Order 10521 to Executive Order 10807: (c) Provisions of Executive Order 10521, as amended, shall not limit the functions of the Federal Council under Executive Order 10807; nor shall Executive Order 10807 limit the functions of any Federal agency or officer under Executive Order 10521, as amended.

Advisory status of Federal Council: (d) The Council shall be advisory to the President and to the heads of Federal agencies represented on the Council. Executive Order 10807 shall not be construed as subjecting any agency, officer, or function to control by the Council.

COMPARISON OF E.O. 9912 WITH PSAC RECOMMENDATIONS AND WITH E.O. 10807

The following chart sets forth the provisions of the Executive order which established the Interdepartmental Committee on Scientific Research and Development in juxtaposition to the recommendations for the Federal Council for Science and Technology in the PSAC report, *Strengthening American Science*, and to Executive Order 10807 which established the Council.

INTERDEPARTMENTAL COMMITTEE-FEDERAL COUNCIL RELATIONSHIP

It is obvious from the chart that in many respects the general format recommended by the PSAC report for the Federal Council followed that in the Executive order which established the Interdepartmental Committee. Major differences were in the level of representation and in the definition of functions for the Federal Council. The intention was clearly to establish a policy-level body with broader functions than had been given to the Interdepartmental Committee. The fact that the PSAC report recommended examination of the Executive order which had established the ICSRD to ensure that it was consonant with the functions recommended for the new council indicated that it did not view the new body would be merely a substitute for the other.

Executive Order 10807 resolved the problem by abolishing the ICSRD but specifying that at least one standing committee of the Federal Council shall be composed of scientist-administrators to provide a forum for consideration of common administrative policies and procedures on, and recommendations relating to, Federal research and development activities.

COMPARISON OF EXECUTIVE ORDER 9912 WITH RECOMMENDATIONS IN "STRENGTHENING AMERICAN SCIENCE" AND EXECUTIVE ORDER 10807

Executive Order 9912, Dec. 24, 1947

Recommendations in PSAC Report "Strengthening American Science"

Executive Order 10807, Mar. 13, 1959

Name	Interdepartmental Committee for Scientific Research and Development	Federal Council for Science and Technology	Federal Council for Science and Technology
Members	Official designated by head of agencies and such others as President may determine hereafter: Department of Interior; Department of Agriculture; Department of Commerce; National Advisory Committee for Aeronautics; Federal Security Agency; Atomic Energy Commission; Department of Army, Navy, and Air Force and National Military Establishment; Veterans' Administration; Smithsonian Institution.	Each department or agency with substantial interest in S. & T. Secretary of departments to designate policy level representatives; heads of independent agencies to represent their agencies. Suggested initial membership: Policy level representatives of Departments of Interior, Agriculture, Commerce, HEW; Administrator, NASA; Commissioner, AEC; Director of Defense Research and Engineering; Other departments and agencies when necessary.	(1) Special Assistant to the President for Science and Technology; (2) 1 representative of policy rank to be named by Secretary of these departments: Department of Defense; Department of the Interior; Department of Agriculture; Department of Commerce; Department of Health, Education, and Welfare; (3) Director, National Science Foundation; (4) Administrator, National Aeronautics and Space Administration; (5) Chairman or another member of the Commission of the Atomic Energy Commission.
Observers		Bureau of the Budget; Department of State	Department of State; Bureau of the Budget.
Chairman	Designated annually by the President	Special Assistant to President for Science and Technology	To be designated by the President from time to time from among the members. Chairman to designate members to act temporarily as Chairman. Chairman may request representation from nonmember or observer agencies at meetings concerned with matters of substantial interest to those agencies; Chairman may also invite other persons to attend Council meetings. At call of Chairman.
Participation by other agencies			
Meetings			
Functions	Recommend actions to make Federal R. & D. programs most effective in promotion of national welfare. Study and recommend changes in administrative policies, procedures, practices: Grants and contracts; Personnel policies; Encourage collaboration among Federal R. & D. agencies. Recommend means to improve dissemination of scientific and technical information. Obtain advice of persons outside Government on matters of concern to Committee. Perform such other duties as President may prescribe.	(i) Consider the impact of Government research and development policies and programs on nongovernmental programs and institutions for the purpose of furthering in every proper way the general advancement of American science and technology. (ii) Consider problems and developments in the fields of science and technology affecting more than 1 department or agency and recommend policies and other measures to promote more effective planning and administration of Federal scientific and technological programs. To aid in developing such policies the Council should: (a) Prepare a projection of the program costs needed to meet the scientific and technological needs of the Federal Government including capital requirements and manpower. (b) Consider the level and type of research financed by the private sector of the economy, consulting as appropriate the National Academy of Sciences, the Engineers Joint Council, and the Social Science Research Council in order to ensure, as far as possible, that public and private efforts are complementary.	(a) Consider problems and developments in the fields of science and technology and related activities affecting more than 1 Federal agency or concerning the over-all advancement of the Nation's science and technology, and recommend policies and other measures— (1) to provide more effective planning and administration of Federal scientific and technological programs, (2) to identify research needs including areas of research requiring additional emphasis. (3) to achieve more effective utilization of the scientific and technological resources and facilities of Federal agencies, including the elimination of unnecessary duplication, and (4) to further international cooperation in science and technology. In developing these policies the Council, after consultation, as

considered appropriate by the Chairman, with the National Academy of Sciences, the President's Science Advisory Committee or other organizations, shall consider—

- (i) the effects of Federal research and development policies and programs on non-Federal programs and institutions,
 - (ii) long-range program plans designed to meet the scientific and technological needs of the Federal Government, including manpower and capital requirements, and
 - (iii) the effects of non-Federal programs in science and technology upon Federal research and development policies and programs.
- (b) Consider and recommend measures for the effective implementation of Federal policies concerning the administration and conduct of Federal programs in science and technology.
- (c) Perform such other related duties as shall be assigned consonant with law, by the President or the Chairman.

(a) Each Federal agency represented on the Council shall furnish necessary assistance to the Council . . . Such assistance may include (1) detailing employees to the Council to perform such functions . . . as the Chairman may assign to them, and (2) undertaking, upon request of the Chairman, such special studies for the Council as come within the functions herein assigned to the Council.

(b) Upon request of the Chairman, the heads of Federal agencies shall, so far as practicable, provide the Council with information and reports relating to [their] scientific and technological activities.

Standing committees and panels may be established for the purpose of conducting studies and making reports as directed by the Chairman.

At least 1 such standing committee shall be composed of scientist-administrators representing Federal agencies, shall provide a forum for consideration of common administrative policies and procedures relating to Federal research and development activities and for formulation of recommendations thereon, and shall perform such other related functions as Chairman of the Council may assign.

Chairman shall establish procedures to insure the security of classified information used by or in custody of the Council or employees under its jurisdiction.

(iii) Strengthen Government programs in science and technology, by promoting effective utilization of Government resources, and by promoting full cooperation among Government agencies in the development of programs and plans to meet future scientific and technological needs.

(iv) Consider and recommend measures for the implementation of policy decisions affecting the administration and conduct of Federal programs in science and technology.

Council to prepare projection of program costs needed to meet scientific and technological needs of the Federal Government including capital requirements and manpower; consider and recommend measures for implementation of policy decisions affecting the administration and conduct of Federal programs in science and technology.

Chairman to rely on departments and agencies to provide assistance as needed by the council.

Reports or recommendations

Agency assistance requested to furnish Federal agencies requested to furnish assistance and information.

Standing committees and panels. Chairman may establish subcommittees; members may include persons other than from member agencies.

Security procedures

In general, the organization and functions recommended by the PSAC panel were incorporated into the Executive order establishing the Council. The principal points of difference relate to the chairman, additional functions specified in the Executive order, a provision for establishment of standing committees and panels, and the actions taken to reconcile Executive Orders 9912 of December 24, 1947, and 10521 of March 17, 1954.

Chairman.—The PSAC panel had recommended that the Special Assistant to the President for Science and Technology should be the chairman of the Federal Council; the Executive order specified that the chairman shall be designated by the President from among the Council membership. In practice, the President has always designated his Special Assistant for Science and Technology or Science Adviser as chairman of the Federal Council.

The Executive Order provided that the Council shall meet at the call of the Chairman. Another important function of the Chairman was the assignment to him in the Executive order to "submit to the President such of the Council's recommendations or reports as require the attention of the President by reason of their importance or character." (Section 2(d).) Presumably the determination of which recommendations or reports should be submitted to the President would be made by the Chairman, in concert with the Council.

Functions.—The Executive order assigned two additional responsibilities to the Council—to recommend policy measures and other needs including areas of research requiring additional emphasis (identification of gaps); and, to further international cooperation in science and technology. Provision for the assignment of additional functions not specified in the Executive order was made in a general assignment to the Council to perform "such other related duties as shall be assigned, consonant with law, by the President or by the Chairman."

Standing Committees and Panels.—The PSAC panel report was silent on the establishment of subcommittees. However, section 4 of Executive Order 10807 authorized the establishment of standing committees and panels for the purpose of conducting studies and making reports, and directed that at least one standing committee should be composed of scientist-administrators to provide a forum for consideration of common administrative policies and procedures relating to Federal research and development activities and the development of recommendations.

RECONCILIATION WITH OTHER EXECUTIVE ORDERS

Executive Order 10807 revoked Executive Order 9912 of December 24, 1947, thereby abolishing the Interdepartmental Committee on Scientific Research and Development. It also amended Executive Order 10521 of March 17, 1954 to delete section 8(c) which had directed the Interdepartmental Committee to maintain and disseminate information on equipment and facilities for multiagency use. Sections 1 and 3 of that Executive order were further amended to clarify that the authority of the National Science Foundation extended to basic scientific research and education in the sciences, rather than to scientific research in general. Finally, a new section 10 was added to

Executive Order 10521 assigning to the National Science Foundation a leadership role in the coordination of scientific information activities.

CLARIFICATION OF FEDERAL COUNCIL AUTHORITY VIS-A-VIS FEDERAL AGENCIES

The final two sections of Executive Order 10807 defined the authority of the Federal Council vis-a-vis other Federal agencies. Section 6(c) provided that Executive Order 10521, as amended, shall not limit the functions of the Federal Council as defined in this order, nor shall Executive Order 10807 limit the functions of any Federal agency or officer under Executive Order 10521. Section 6(d) stated unequivocally, "The Council shall be *advisory* to the President and to the heads of Federal agencies represented on the Council; accordingly, this order shall not be construed as subjecting any agency, officer, or function to *control* by the Council." [italics supplied.]

AMENDMENT TO EXECUTIVE ORDER 10807

Executive Order 10807 has been amended only once since its promulgation, by Executive Order 11381 of November 8, 1967. This latter order added representatives from the newly-established departments of Housing and Urban Development, and Transportation to membership on the Council and also elevated the Department of State from observer to member status.

EXECUTIVE ORDER 10807 IS THE BASIS FOR TITLE IV OF P.L. 94-282

Further evidence of the durability of Executive Order 10807 is that the statutory provisions of the National Science and Technology Policy, Organization and Priorities Act (P.L. 94-282) which established the Federal Coordinating Council for Science, Engineering, and Technology are drawn in large part from it. (See Section VII).

ORGANIZATION AND OPERATIONS OF THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY (1959-1962)

ADVISORY STATUS OF THE COUNCIL

Section 6(d) of Executive Order 10807 defined the Federal Council's role as "advisory to the President and to the heads of Federal agencies represented on the Council . . ." This meant that the Council's activities were privileged information. The advisory status of the Council was reinforced by President Eisenhower's designation of his Special Assistant for Science and Technology to be the chairman. Under the terms of the Executive order, the Council met at the call of the chairman. Thus, the Council occupied a privileged status by definition, and because it was under the direction of a person who also served in an advisory role to the President.

The privileged status of the Federal Council was responsible for congressional uneasiness, frustration, and irritation from the beginning. It meant that the only information made public concerning the Council or its constituent bodies was that which the President wished to release. The Council could not be questioned by Congress concerning its activities or operations nor did it have to report to Congress.

This reticence was particularly frustrating to the Subcommittee on Reorganization and International Organizations of the Senate Government Operations Committee which since 1957 had been involved in an investigation of the need for reorganization of Federal scientific and technical activities and had introduced legislation to establish a Department of Science and Technology. The Subcommittee chairman, Senator Hubert Humphrey, had invited Dr. Killian to testify at hearings during April and May 1959. Dr. Killian refused on the basis of his White House advisory role. The following letter of March 31, 1959, was introduced into the May 28, 1959, hearing record:¹⁴

DEAR SENATOR HUMPHREY: I appreciate very much being invited to testify at the hearings to be held by the Senate Committee on Government Operations and bill S. 676 to create a Department of Science and Technology.

Under normal circumstances, I would welcome the opportunity to testify. Under present circumstances, I believe it to be inappropriate for me to do so because of my advisory functions here in the White House.

You doubtlessly know about the report of the President's Science Advisory Committee entitled "Strengthening American Science."

This report contained comments and recommendations germane to the hearings which the committee is holding. It was in this report that the recommendations originated for establishing the Federal Council for Science and Technology which has now been brought into being by a Presidential Executive order.

I enclose a copy of this report on the chance that you might not have had an opportunity to see it.

Senator Humphrey decried the inability of Congress to get full information upon which to take constructive action. When a witness, NSF Director Alan Waterman, noted that the Council would be bringing directly to the President those matters which need to be considered by the President personally, Senator Humphrey asked: "What does this wonderful council ever say to the Congress?" Not agreeing with Dr. Waterman's response, he continued, "Let me tell you what my view of it is. I understand the reports of those councils are Executive privilege reports. Members of Congress never see them. We see the reports as they are filtered, strained, restrained, and constrained. In other words, we see them after they have been given the working over by the Bureau of the Budget and everybody else. . . . we never get the real gory details. . . . I use this opportunity to say that I protest this kind of treatment and withholding of privileged material. It just makes it impossible for a committee of Congress to ever get full information upon which to take constructive action."¹⁵

¹⁴ U.S. Congress, Senate, Committee on Government Operations, Subcommittee on Reorganization and International Organizations, Create a Department of Science and Technology. Hearings . . . 86th Congress, 1st session on S. 676, S. 586, S. 1551. Washington, U.S. Govt. Print. Off., 1959. 2 parts. Part 2, pp. 127-128.

¹⁵ Ibid, p. 128.

Later on, Senator Humphrey observed, "I can understand from the Executive point of view how they would like to keep that all to themselves, but I have a feeling that only when these councils in the Executive Office of the President share frankly with legislative representatives openly, candidly, and cooperatively, that there will be real cooperation and coordination of the Federal science activities."¹⁶

Consequently, during the 1959-1962 period, before the Office of Science and Technology was established there is little published information about the Federal Council.

FIRST PUBLISHED ACTIVITIES REPORT ON FEDERAL COUNCIL IN 1962

After three years of silence, the Administration in 1962 took the initiative in offering to prepare for Congress an activities report concerning actions taken by the Executive Office science advisory units. It came about when Deputy Bureau of the Budget Director Elmer B. Staats testified before the Senate Government Operations Committee in May 1962 on pending legislation to create a Commission on Science and Technology and on Reorganization Plan No. 2,¹⁷ to create an Office of Science and Technology. Mr. Staats' remarks were directed toward putting off action to create a Commission on Science and Technology because of improvements in organization, planning and operation of Federal science programs during the past few years, and because of further expected improvements through the reorganization plan. He reviewed some of the improvements and then made the offer:¹⁸

I have mentioned, Mr. Chairman, only a few of the activities to give you some idea of the scope and breadth of the subjects which we have been concerned with. It occurs to me that, if the committee desired, we would be willing to consider with the Science Adviser, and with the Director of the National Science Foundation, a kind of progress report on the varied activities that we have been concerned with trying to lead to some improvement in their management.

The Chairman accepted the offer. Subsequently, Mr. Staats transmitted a document entitled, "Report on Federal Council for Science and Technology" to the Chairman with a covering letter of June 26, 1962.¹⁹ The report discussed the authority, functions, and organization of the Federal Council, included a brief summary section on Council activities, and short reports on the functions and activities of each of the seven committees which had been established to date. (Appendix H). Although brief, the report provided useful clues to subjects which had engaged the attention of the Federal Council during its first years.

MEMBERSHIP

The initial list of Council members is shown on p. 74. For comparison, a listing of the members of the Interdepartmental Committee on Scientific Research and Development before its abolition is also shown.

¹⁶ Ibid, p. 129.

¹⁷ U.S. Congress, Senate, Committee on Government Operations. Create a Commission on Science and Technology. Hearing, 87th Congress, 2d session on S. 2771. May 10, July 24, 1962. Washington, U.S. Govt. Print. Off., 1962. 2 parts. Part 1, pp. 22-34.

¹⁸ Ibid, p. 27.

¹⁹ Report on Federal Council for Science and Technology. In Create a Commission on Science and Technology. Hearings. Ibid, part 2, pp. 159-167. Referred to subsequently as the "1959-62 report."

TABLE 1
COMPARISON OF INITIAL FCST MEMBERSHIP WITH ICSRD MEMBERSHIP

Federal Council for Science and Technology ¹		Interdepartmental Committee on Scientific Research and Development ²
Executive Office of the President.	Dr. James R. Killian, Jr. (chairman)	
Department of Agriculture.....	Ervin L. Peterson, Assistant Secretary of Agriculture.	Dr. Byron T. Shaw, Administrator, Agricultural Research Service.
Department of Commerce.....	Lewis Strauss, Secretary of Commerce.....	Dr. A. V. Astin, Director, National Bureau of Standards.
Department of Defense.....	Dr. Herbert F. York, Director of Defense Research and Engineering.	Mr. J. B. Macauley, Deputy Director of Defense Research and Engineering, DOD; Rear Adm. Rawson Bennett, Chief, ONR, Navy; Maj. Gen. Marvin C. Demler, Director of Research and Development, Deputy Chief of Staff, Air Force; Dr. Richard A. Weiss, Scientific Director, Army Research, Army.
Department of Health Education, and Welfare.	Aims C. McGuiness, Special Assistant to the Secretary.	Assistant Surgeon General James A. Shannon, Director, National Institutes of Health.
Department of the Interior.....	Elmer Bennett, Under Secretary of the Interior.	Dr. Thomas B. Nolan, Director, Geological Survey (Vice Chairman).
Department of State.....	Dr. Wallace Brode, Science Adviser (observer only).	Dr. Wallace Brode, Science Adviser to the Secretary of State.
Atomic Energy Commission.....	Willard Libby, Commissioner.....	Dr. Charles L. Dunham, Director, Division of Biology and Medicine.
Bureau of the Budget.....	Elmer Staats, Deputy Director (observer only).	
National Aeronautics and Space Administration.	Dr. T. Keith Glennan, Administrator.....	Dr. Hugh L. Dryden, Deputy Administrator.
National Science Foundation..	Dr. Alan T. Waterman, Director.....	Dr. Alan T. Waterman (Chairman).
Veterans' Administration.....		Dr. John B. Barnwell, Asst. Chief Medical Director for Research and Education.
Smithsonian Institution.....		Dr. Leonard Carmichael, Secretary.

¹ Persons named on notice of first Council meeting, Mar. 24, 1959.

² "Congressional Directory," March 1959.

In a few cases, the same individual represented his agency on both bodies, but for the most part the Federal Council members were of considerably higher level. The Department of Defense had had four representatives on the Interdepartmental Committee but now had only one on the Federal Council.

The State Department was accorded only observer status despite the fact that one of the stated objectives of the Council was to "recommend policies and other measures * * * to further international cooperation in science and technology." This situation was not remedied until 1967 when the Department was accorded member status.²⁰ A third agency observer during this period was the Administrator, Federal Aviation Agency.

Determining which departments and agencies should be represented on the Council was reported to have been one of the reasons for the delay in setting it up.²¹ Executive Order 10807 followed the recommendations of the FSAC report, by including those agencies with the largest expenditures for scientific activity.

It is also reported that the assignment to the Secretary of each of the five departments to be represented the task of designating an official of policy rank to sit on the Council had an immediate salutary effect. It brought to the fore in the departments the question whether they had an official of policy rank who could represent all the scientific activity within that department. If such a person could not be found, "duties were assigned and staff work was begun that would fill the need. This is one of the things the Science Advisory Committee's report was designed to accomplish."²²

²⁰ Executive Order 11381, Nov. 8, 1967.

²¹ Science Advisory Committee's Recommendation for Science Council Being Implemented by Executive Order, op. cit., p. 708.

²² Ibid, p. 709.

The Commerce and Interior Departments are cases in point. In the former case, initially the Secretary represented his department; similarly, the Under Secretary represented the Interior Department. Subsequently, an authority to establish one Assistant Secretary in the Department of Commerce was granted.²³ This position has been designated Assistant Secretary for Science and Technology and the incumbent is the Commerce representative on the Federal Council. In the Department of the Interior a Science Adviser to the Secretary was named and this person represented the Department.²⁴

ATTENDANCE AT COUNCIL MEETINGS

During this initial period, the record of attendance by designated members of the Council was quite good. In later years this was not the case in many instances.

MEETINGS

The Federal Council for Science and Technology held its first meeting on March 24, 1959. It held eight more meetings in 1959. There were nine meetings in 1960; eleven in 1961; and thirteen in 1962.²⁵

The meetings were under the direction of the Special Assistant to the President for Science and Technology and were regarded as advisory to the President. As such, they were closed to all except members, observers, invited representatives, and staff.

Meetings of the Federal Council proper were separate from meetings of each of the several subject area committees and panels which were established under the Federal Council. Limited information is available for this early period; most met several times a year and at least one of these committees met monthly.

STAFFING AND FUNDING

During the 1959-1962 period, the Federal Council was located in the Office of the Special Assistant to the President for Science and Technology. The Special Assistants were James R. Killian, Jr., until July 1959, Dr. George B. Kistiakowsky, from July 1959 to January 1961, and Dr. Jerome B. Wiesner, January 1961 to January 1964. There is nothing in the public record to indicate what staffing was made available to the Council beyond the Executive Secretary. According to a former staff member, total full-time professional staff serving the Special Assistant, PSAC and its panels, and the Federal Council never exceeded eight full-time professionals during the period preceding the establishment of the Office of Science and Technology.²⁶

Robert N. Kreidler, a technical assistant in the Office of the Special Assistant, was the first executive secretary of the Council. He served until July 1961. This was not a full-time position. Mr. Kreidler is listed as technical assistant to the panel on basic research and graduate

²³ P.L. 87-405, Feb. 16, 1962.

²⁴ The present Interior representative is the Assistant Secretary for Energy and Minerals.

²⁵ U.S. Congress, House, Committee on Government Operations. The Office of Science and Technology; A Report Prepared by the Science Policy Research Division . . . for the Military Operations Subcommittee. Washington, U.S. Govt. Print. Off., 1967. 326 p. [at head of title: 90th Congress 1st session, Committee print.] p. 55.

²⁶ Kreidler, Robert N. The President's Science Advisers. In Gilpin, Robert and Christopher Wright: Scientists and National Policy-Making. New York, Columbia University Press, 1964, 307 p. At p. 121.

education of the President's Science Advisory Committee which reported November 1960 on "Scientific Progress, the Universities, and the Federal Government."

Dr. Edward Wenk, Jr., succeeded Mr. Kreidler as executive secretary, and continued in this position through the establishment of the Office of Science and Technology until he left the Executive Office of the President to establish a new Science Policy Research Division in the Library of Congress in 1964.

Staffing for the committees set up under Federal Council aegis was provided by participating agencies as authorized by section 3 of Executive Order 10807. The 1959-62 report noted that "committee chairmen ordinarily designate members of their own organization to assist. While this staff effort is usually on a part-time basis, the scope of activities in the case of the Interagency Committee on Oceanography now involves full-time assistance."

The PSAC panel which recommended the establishment of the Federal Council had suggested the National Science Foundation and the Bureau of the Budget as possible sources of staff assistance. The record indicates that both did provide assistance but does not show how much was furnished.

Expenses for the Special Assistant, the President's Science Advisory Committee and the Federal Council's activities came out of an allocation for Science and Technology in the White House Special Projects Fund. Table 2 provides as much information concerning the Fund as is publicly available, from appropriations data or other published sources. Since no breakdowns of the Science and Technology component were found, we do not know what part of these funds went for the support of the Federal Council.

TABLE 2

SCIENCE AND TECHNOLOGY IN THE WHITE HOUSE SPECIAL PROJECTS FUND, FISCAL YEARS 1958-62

	Actual obligations: Fiscal year—				
	1958	1959	1960	1961	1962
Special projects, White House Office:					
Appropriation.....	\$1,375,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000
Actual obligations.....	1,381,295	1,329,970	1,301,000	1,258,000
Functions:					
Science and technology.....			1 195,000	2 435,000	3 4 698,000
Personnel management.....					
Public works planning.....					
Council on Foreign Economic Policy.....					
These functions account for the balance of the Special Projects Fund.					
Total positions, Special Projects Fund.....	114	120	120	5 110	5 120

¹ Estimated obligations, fiscal year 1960 as of Feb. 29, 1960. Source: House, General Government Appropriation for 1961, p. 99.

² Estimated obligations. Source: Senate, General Government Matters Appropriation, 1962, p. 690.

³ Estimated expenditures. Source: Senate, Independent Offices Appropriation, 1963, p. 117.

⁴ Dept. BOB, Director Staats stated that an estimated $\frac{1}{4}$ of the total Special Projects Fund would be allocated to the work of the science adviser and the President's Advisory Committee. Source: Senate, General Government Matters Appropriation, 1962, p. 689.

⁵ Estimated.

RECAPITULATION OF FCST FUNCTIONS UNDER EXECUTIVE ORDER 10807

Executive Order 10807 assigned to the Federal Council three broad functions. The first was the responsibility to consider problems and developments (potential problems) in science and technology in two broad categories:

- (1) Those affecting *more than one* Federal agency; or
- (2) Those relating to the over-all advancement of science and technology in the Nation.

Recommendations by the Council for the promulgation of policies or for other actions were to be directed toward achievement of certain enumerated objectives:

- (1) More effective planning and administration of Federal programs;
- (2) Identification of research needs and areas of research requiring additional attention;
- (3) More effective utilization of Federal scientific and technological resources and facilities; and
- (4) Promotion of international cooperation in science and technology.

The second function of the Council was to make recommendations on ways to effectively implement Federal policies (those already existing or those proposed) concerning both the administration and the conduct of Federal scientific and technological programs.

The third main assignment to the Council was to perform "such other related duties . . . , consonant with law" as the President or the Chairman shall assign.

The Executive order directed the Chairman to submit to the President those recommendations or reports by the Council which by reason of their importance or character require his attention.

The 1959-62 Council report noted that the Council had been "highly selective" in choosing topics for attention, study and continuing review. The report observed further:

The authority, missions and roles, actions and operations of individual agencies constitutes the predominant mechanism for the accomplishment of Federal programs in science and technology. However, the Federal Council responsibility cuts across all disciplines and all agencies to deal with both science and technology to make sure that these programs develop so as to be coherent, consistent and coordinated; and neither a plurality of fragmented programs, nor merely a super imposition of individual departmental activities.

FUNCTIONS UNCHANGED 1959-1976

Throughout its entire existence, the formal assignment of functions to the Federal Council under Executive Order 10807 remained unchanged. However, none of the functions assigned to the Council was mutually exclusive. The establishment of the Office of Science and Technology within the Executive Office of the President and the assignment to it of functions even more broad than those of the Federal Council probably resulted in certain informal realignments of functions between the two units.

The functions assigned to the new Federal Coordinating Council for Science, Engineering, and Technology under P.L. 94-282, are in large part the functions originally assigned to the Federal Council by Executive Order 10807 with these exceptions: The assignment to consider problems and developments relating to the "over-all advancement of the Nation's science and technology" (section 2(a) of Executive Order 10807) has been omitted. Nor does the original

assignment in section 2(b) to consider and recommend measures to implement Federal policies concerning the administration and conduct of scientific and technological programs appear in the new statutory basis. However, the stated legislative intent is that the new Coordinating Council "exercise the same functions as those heretofore exercised by the Federal Council for Science and Technology."²⁷ This aspect is treated further in Section VII.

A further related omission from P.L. 94-282 is the direction to the Chairman to transmit recommendations of the Council to the President for action (section 2(d)).

SUMMARY OF ACTIVITIES, 1959-62

From the limited amount of information which is available about the early years of Council activity, several generalizations can be made which have current relevance:

1. *In kind and scope, Federal Council activities have been diverse and wide-ranging.* The summary of Council activities from the 1959-1962 report cites activities under each of the Council's assigned functions. This section is reproduced below to illustrate the point and to provide a ready reference for subsequent discussion of the enumerated items:²⁸

COUNCIL ACTIVITIES

1. Planning and administration of scientific and technological programs: Interagency programs are formulated by appropriate Council Committees with recommendations for program and budget; these are then reviewed by the Council to evaluate balance, scope, consistency and match with needs of science, as follows:

- Oceanography
- Atmospheric sciences
- Water resources
- High energy physics

2. Identification of research needs and new areas requiring additional emphasis or coordination:

- Behavioral sciences
- Fire technology
- Natural resources
- Materials research

3. Improved utilization of scientific and technological resources and facilities of the Federal Government, including elimination of unnecessary duplication, and measures for effective implementation of Federal policies concerning administration and conduct of Federal programs:

(a) Science information—Government-wide policies and programs.

(b) Long-range planning—Appointment of committee and request of NSF to prepare long-range projections of demand for scientific resources; manpower, facilities and funds.

²⁷ National Policy, Organization, and Priorities for Science, Engineering, and Technology Act of 1976. Joint Report [To Accompany S. 32] for the Committee on Labor and Public Welfare, Committee on Commerce, and Committee on Aeronautical and Space Sciences. 94th Congress, 2d session. Senate Rept. 94-622, p. 22.

²⁸ 1959-62 Report, op. cit., p. 160.

(c) Problems in recruitment and retention of superior scientific personnel in Government—both salary and environmental factors.

(d) Conflict of interest regulations.

(e) Establishment of governmentwide policies on: Indirect costs; page charges (policy announced October 25, 1961); Institutional grants.

(f) Problems in "quality control" over inhouse research and over assessment of proposals and monitoring of contract research.

(g) Study and development of policies in scientific and technical manpower.

4. International aspects of science:

(a) Guidelines for development of consistent agency policies for oversea activities.

(b) Mobilization of other agencies talents for use by AID.

(c) Steps to improve the image abroad regarding U.S. science and technology.

(d) Stimulation of an international program in special scientific areas—scientific hydrology.

(e) Steps to strengthen free world science.

The range of activities illustrates also why the Federal Council has been characterized as a "science sub-Cabinet."²⁹

(a) *Planning and administration of interagency scientific and technological programs*

Oceanography.—A Subcommittee on Oceanography, later an Interagency Committee on Oceanography (ICO), was established by the Federal Council in 1959, to take over the role of a predecessor informal Coordinating Committee on Oceanography. The mission of the ICO was to develop annually a national oceanographic program in which agencies' needs in research, surveys, training and manpower, oceanographic ships, instrumentation and facilities, and international programs are coordinated and balanced. National oceanographic programs for fiscal year 1961, 1962, and 1963 were submitted to Congress. As of mid-1962, the ICO was engaged in developing 10-year projections in all agencies to be consolidated into a long-range program in oceanography, expected to be presented to the Council in 1963. In addition, activity was underway in a variety of related oceanographic problems.³⁰

The Interagency Committee on Oceanography continued to function until 1966 when a National Council on Marine Resources and Engineering Development was established by legislation. The ICO provided staff assistance to the new Council initially. It ceased to function as a Federal Council committee in 1967. In 1971 after the Marine Council had gone out of existence, a new Interagency Committee on Marine Science and Engineering was established which continues to the present.

Atmospheric sciences.—A Federal Council Interdepartmental Committee for ^{on U.S. President's} Atmospheric Sciences was appointed in August 1959. Its

²⁹ Jerome At p. 15; testimony before the House Committee on Government Operations, Systems Development and Office of Science and Technology, 87th Congress 2d sess. July 31, 1962, p. 150.
³⁰ 1959-62. During p. cit., pp. 163-164.

principal activity during the early years was a continuing effort to develop a coordinated national atmospheric program. ICAS also considered and made recommendations on such special issues as support for the National Center for Atmospheric Research, continued weather reconnaissance by the Air Force, and climatological research in the Weather Bureau.³¹

ICAS is one of the three Federal Council committees which has had a continuous existence from 1959. (See Appendix L.)

Water resources.—Water resources research needs were initially considered within the Federal Council by an ad hoc subcommittee on hydrology of the Standing Committee. In June 1961 a special subcommittee on water research was appointed under the Committee on Natural Resources to participate in the broad assignment of President Kennedy to his Science Adviser and the Federal Council to "review ongoing Federal research activities in the field of natural resources and to determine ways to strengthen the total government research effort."³² A summary of the subcommittee's initial study was transmitted by letter to the Senate and House Appropriations Committees in April 1962.

Further progress to develop a Government-wide water resources program was impeded because of longstanding jurisdictional concerns of the participating agencies. In September 1962, Science Adviser Jerome Wiesner, with the President's concurrence, appointed a special policy level task group reporting directly to the Federal Council and assigned it the following functions:³³

(a) Identify problems in water management and control that require research and development;

(b) Inventory on-going research, both basic and applied, and compile annual budgets in water research;

(c) Develop background information to illuminate policy alternatives considering both intramural and extramural effort; and

(d) Coordinate research activities performed in different Federal agencies.

This task group completed its assignment in December 1962. Its report was reviewed by the Council and that portion of the recommendations which the Council endorsed was transmitted by the President to the Congress February 18, 1963. Dr. Wiesner told the House Government Operations Committee that the report "represents the first comprehensive statement of objectives and activities of all Federal agencies engaged in water resources research, and is intended to provide policy guidance within the executive branch, to all departments, to the Bureau of the Budget, and to my office."³⁴ In December 1962, the Federal Council established a standing Committee on Water Resources Research, which has been continued to the present time.

High Energy Physics.—In this area, as in the three preceding areas—oceanography, atmospheric sciences, and water resources—Federal Council activity was reflected in the activity of an inter-agency committee. This interagency committee—the Technical Committee on High Energy Physics—was established in 1959 upon the

³¹ *Ibid.*, p. 164.

³² U.S. President. Special Message to the Congress on Natural Resources, Feb. 23, 1961, Public Papers of the Presidents, 1961, p. 14.

³³ U.S. Congress. House Committee on Government Operations. Subcommittee on Policy, Agriculture, and Power. Water Pollution Control and Abatement (Part IB—National Survey). Hearings, 1st session, June 14, 1963. Washington, U.S. Govt. Print. Off., 1964. Pp. 1235-1236. Senate Ref. Committee, Congress

³⁴ *Ibid.*, p. 1236.

recommendation of a joint panel of the President's Science Advisory Committee and the General Advisory Committee of the Atomic Energy Commission to conduct a continuing technical review of planning, support, and coordination of the high energy programs of the Federal agencies.³⁵ Initially, the Committee coordinated programs in high energy physics sponsored by the AEC, NSF, DOD, and NASA: over the years support became concentrated in the AEC and NSF. Consequently, in June 1969 Federal Council Chairman DuBridge disestablished the Technical Committee on High Energy Physics as a Federal Council committee. At the same time he invited it to continue to operate under other appropriate auspices and said the Council would consider any recommendations the group might wish to make even though it was not a formal part of the FCST committee structure.³⁶

(b) *Identification of research needs and new areas requiring additional emphasis or coordination.*

Behavioral Sciences.—Federal Council interest in the behavioral sciences area was undoubtedly at least in part due to the inclusion of social psychology among the fields deserving greater attention by the PSAC Research Panel which had recommended the establishment of the Federal Council. A Life Sciences Panel of the President's Science Advisory Committee subsequently surveyed the current status of the behavioral sciences; its report was released in March 1962, by the Special Assistant for Science and Technology. One of the recommendations of the Panel was that the increasing need for good behavioral data justified a re-examination of present needs and opportunities and a continuing review of ongoing activities. This should be the subject for review and study by both the Social Science Research Council and "a group broadly representative of relevant government agencies . . . appointed to follow current and planned activity in this field and to provide appropriate advice in the light of the current possibilities and needs of behavioral science."³⁷

The Federal Council accepted the PSAC Panel's recommendations that the Federal effort in the behavioral sciences should be strengthened, and later that year established a Committee on the Behavioral Sciences "to describe and evaluate current research, to identify problems that could be approached through research in this area, and to suggest steps that would strengthen the capacity of these sciences to contribute to the solution of national problems."³⁸

Fire Technology.—According to the Fiscal Year 1961-62 Annual Report of the National Academy of Sciences, a four-week summer study on means of fire prevention was conducted in 1961 under the auspices of the Academy-Research Council's Committee on Fire Research, whose activities were Government financed, and the report of the study was to be made to the Federal Council for Science and Technology in November.

³⁵ U.S. Special Panel of President's Science Advisory Committee and General Advisory Committee to the Atomic Energy Commission. U.S. Policy and Actions in High-Energy Accelerator Physics. Report . . . 1958. In U.S. Congress. Joint Committee on Atomic Energy. High Energy Physics Program: Report on National Policy and Background Information. Washington, U.S. Govt. Print. Off., February 1965. 89th Congress 1st session. Joint Committee Print, pp. 135-142.

³⁶ U.S. Office of Science and Technology. Federal Council for Science and Technology 1969 Annual Report. Washington, U.S. Govt. Print. Off., 1970, p. 8.

³⁷ U.S. President's Science Advisory Committee. Life Sciences Panel. Strengthening the Behavioral Sciences; Statement by the Behavioral Sciences Subpanel. Washington, U.S. Govt. Print. Off., Apr. 20, 1962, 19 p. At p. 15.

³⁸ U.S. Office of Science and Technology. Federal Council for Science and Technology; Interim Report on Activities During Calendar Year 1963. Typescript, p. 15.

The Federal Council's 1962 annual report noted that needs had been reviewed for additional emphasis on federally sponsored fire research and that "recommendations were adopted that research training and information activities in this field be accelerated and the Department of Commerce be assigned responsibility as a focal agency for basic research and for coordination of planning in other agencies."³⁹

Natural Resources.—A Federal Council Committee on Natural Resources was established in March 1961 in response to a request from President John F. Kennedy to his Science Adviser and the Federal Council "to review ongoing Federal research activities in the field of natural resources and to determine ways to strengthen the total government research effort relating to natural resources."⁴⁰ In a subsequent message to Congress on conservation of March 1, 1962, and when transmitting a report on water resources research in February 18, 1963, the President reiterated the assignment. The Council's study was intended to supplement a broader study previously requested from the National Academy of Sciences. Seven subcommittees were established to examine the status of federally sponsored research and program needs in energy, biological, water, land, and mineral resources, air as a resource, and the economics of resources.

The completed report was transmitted to the President on May 29, 1963. Attached appendices for each of the seven areas contained the results of the Federal inventory of research and development expenditures by field and agency for fiscal years 1962, 1963 and a 10-year projection to fiscal year 1973.⁴¹

President Kennedy transmitted the natural resources study to the Congress in June 1963 with a covering letter which noted that Dr. Wiesner, Chairman of the Federal Council, had "pointed out that this inventory of activities on natural resources research should help prevent inadvertent duplication of effort and overlap of functions, and should indicate opportunities for mutually supporting activities in the future."⁴² The President said the inventory was an "essential step in Government-wide planning." He called attention to the importance of coordination, in view of the fact that budget requests for resources research and development for fiscal year 1964 totalled \$1.5 billion, "of which more than \$1 billion is for energy related research." He directed the Federal Council to "continue to provide policy level oversight and coordination in scientific and technical programs devoted to natural resources."

An immediate benefit from the natural resources study was that the inventories of Federal research activity in the several areas were completed in the fall of 1962 and contributed to the preparation of the fiscal year 1964 budget.⁴³ Individual agencies and the Bureau of the Budget were furnished guidelines upon which to evaluate individual agency components in relation to the total Federal program.⁴⁴

³⁹ U.S. Office of Science and Technology. Federal Council for Science and Technology; 1962 Annual Report. Washington, U.S. Govt. Print. Off., 1963. p. 9.

⁴⁰ Special Message to the Congress on Natural Resources, Feb. 23, 1961. op. cit.

⁴¹ U.S. Office of Science and Technology. Federal Council for Science and Technology. Committee on Natural Resources. Research and Development on Natural Resources. Report. Washington, U.S. Govt. Print. Off., May 1963. 134 p.

⁴² U.S. President (John F. Kennedy). Letter to the President of the Senate and to the Speaker of the House Transmitting Report "Research and Development on Natural Resources. Dated June 21, 1963. Released June 22, 1963. Public Papers of the Presidents, 1963. pp. 496-497.

⁴³ Research and Development on Natural Resources. Report. Op. cit. p. vi.

⁴⁴ Ibid.

The natural resources report appears not to have had a lasting impact. Perhaps the very general nature of its title obscured the specific information contained therein. For example, the report on energy resources appears to have been generally overlooked, and contemporary reviews of energy studies commonly start with the Office of Science and Technology 1966 interdepartmental study, *Energy R & D and National Progress*, which President Kennedy had requested in February 1963 before the natural resources report had been completed.

A capsulized summary of observations from the report of the Federal Council energy resources subcommittee is excerpted below:⁴⁵

. . . It is reasonable to assume that consumption of all forms of energy will nearly double by 1980. . . .

Known reserves of the fossil fuels . . . constitute only about a 50-year supply at the rate of growth in total energy consumption forecast by the Atomic Energy Commission. Undiscovered reserves . . . are much larger, but it will take much research and development to transform these potential resources into minable reserves. Even then these larger resources are likely to be exhausted within a couple centuries or so. . . .

The bulk of our current requirements for energy are met by coal, oil, natural gas, and their derivatives. These sources probably will continue to supply most of our needs over the next two decades, after which nuclear sources likely will contribute an increasing part. While Federal research must focus on development of [above sources] . . . the Subcommittee believes that the Nation must actively investigate its potential energy resources, including those that are too costly to exploit now or do not seem to hold much promise for the development of large amounts of power. . . .

Recognizing that the future increase in total consumption of energy requires that we develop new sources, research ought also be directed toward increasing the efficiency of energy consumption. . . .

. . . The Subcommittee believes . . . the role of the Federal Government . . . should be the traditional one of filling the gaps left by private industry and other organizations. Generally speaking, this means that the Federal Government must assume responsibility for those investigations that are too large or too complex for private organizations to undertake, or that have so little promise for immediate commercial application as to lie beyond the interest of private parties.

The energy resources report apparently was one whose time had not yet come. The Natural Resources Committee was terminated in 1965. Thereafter, special subject matter committees of the Federal Council dealt with natural resources problems.

Materials Research. The materials research area was another of the "opportunities" identified in the PSAC report "Strengthening American Science"⁴⁶ as requiring greater attention and which President Eisenhower had directed the Council to consider.

⁴⁵ Ibid., pp. 46-47.

⁴⁶ Op. cit. p. 7.

The PSAC report noted a suggestion that a new institute might be needed to work exclusively on new metals and materials but indicated that there might be other alternative ways to deal with the question. Another solution might be to work through the universities, expanding research on materials, and providing opportunities for advanced training to meet manpower needs. At the same time, perhaps materials research should be intensified in Government laboratories of the Atomic Energy Commission, National Aeronautics and Space Administration, the Bureau of Standards, or the Bureau of Mines. The PSAC report was careful to phrase these ideas in the form of suggestions, not recommendations.

At its first meeting on March 24, 1959, the Federal Council established a Coordinating Committee on Materials Research and Development (CCMRD). The Committee was directed to devise programs for initiating action using existing funds and to formulate a materials plan to meet the needs of the Federal Government. Later that year the CCMRD recommended to the Federal Council that interdisciplinary laboratories for materials research be constructed on university campuses with Federal funds from agencies with responsibilities in this field and to supplement existing support of basic materials research.

Upon the Federal Council's recommendation, an interdisciplinary laboratory program was begun in fiscal year 1960, with major support from the Advanced Research Projects Agency, Department of Defense, and additional support from the Atomic Energy Commission and NASA. By the end of 1961, eleven laboratories had been established.

President Kennedy recognized the Federal Council's role in a statement of October 12, 1961, announcing the establishment of a materials research laboratory at the University of North Carolina. He said:⁴⁷

Recognizing that critical qualities of national programs in defense and space exploration would depend on strong reinforcement of national capabilities for materials research and development, the Defense Department, acting on the advice of the Federal Council for Science and Technology and the President's Science Advisory Committee, has already established eight interdisciplinary laboratories at universities. These new ventures . . . will for the first time combine modern progress in solid state physics, chemistry, metallurgy, mechanics, applied mathematics and other related fields. . . . The programs will also train unprecedented numbers and kinds of materials specialists . . .

During its first two years, the Coordinating Committee considered a wide range of materials problems, including renovation and modernization of university research facilities, inadequate funding of inhouse laboratories concerned with materials research, materials information, materials technology transfer, and manpower for materials research programs. These were discussed in a CCMRD report entitled "Problems Deserving Further Study" transmitted by the Chairman of the Federal Council in November 1961.⁴⁸

⁴⁷ Statement by the President Announcing a Contract for a Materials Research Laboratory at the University of North Carolina, Oct. 12, 1961. Public Papers of the President, 1961, p. 665.

⁴⁸ U.S. Congress, Joint Committee on Defense Production, Eleventh Annual Report of the Activities of the . . . Washington, U.S. Govt. Print. Off., 1961. 87th Congress 2d session. Committee Print. at pp. 35-56.

The Coordinating Committee on Materials Research and Development continued to function until it was dissolved in June 1969 by the Chairman of the Federal Council. A new group under the auspices of the National Academy of Sciences assumed an interagency coordinating role from the end of 1969 to 1974 when a new Federal Council Committee on Materials was established.

(c) *Improved utilization of Federal scientific and technological resources and facilities.*

Science Information.—The Executive order which established the Federal Council also formalized the assignment of a leadership role in the coordination of science information activities to the National Science Foundation. The Foundation established an interagency Federal Advisory Committee on Scientific Information. The Committee's effectiveness was impeded by the difficulties of coordinating an area in which there were wide differences regarding management and operation.

A special task force of the Federal Council reported in the spring of 1962 on the need for strengthening agency management of information responsibilities. In May 1962, the Federal Council agreed that (a) each agency would establish a high-level focal point for scientific information functions and (b) that a Federal Council interagency Committee on Scientific Information would be created.⁴⁹

Broadened in 1964 to include technical information activities as well, the Committee on Scientific and Technical Information continued as a Federal Council committee until it was transferred to the National Science Foundation in 1973.

Long-Range Planning.—In September 1961 the Federal Council came to the conclusion that in view of expanding national programs in science and technology and the increased competition for resources, more systematic planning on a continuing Government-wide basis was necessary. Upon its recommendation, a Committee on Long-Range Planning was established later that year. The Committee was headed by Dr. Harvey Brooks of Harvard University and received staff support from the Science Resources Planning office of the National Science Foundation. This was the only Federal Council committee headed by a non-Government employee.

An initial activity was the assignment to the National Science Foundation of the task of conducting an agency survey by questionnaire of future expenditures and manpower needs of the departments and agencies. The Committee encountered great difficulties in carrying out its functions and was discontinued in June 1969.

A further discussion of the Council's long-range planning effort is found below in the activities of the 1964-1969 period. (See p. —.)

Recruitment and Retention of Superior Scientific Personnel in the Federal Service.—The scientific manpower problem had been considered with respect to particular fields by the Federal Council and many of its committees, since their establishment. It was of particular concern to the Council's Standing Committee. A Panel on Environment and Incentives for Research focused on problems concerning the recruitment and retention of superior scientists and engineers in the Federal service.

⁴⁹ U.S. Federal Council for Science and Technology. Committee on Scientific Information. Status report on Scientific and Technical Information in the Federal Government. June 18, 1963. 18 pp. p. 3.

The release in January 1962 of Nicolas DeWitt's study, *Education and Professional Employment in the USSR*, spurred concern over the findings which put the Soviet Union in the lead in production of scientists and engineers. At a press conference on January 15, President Kennedy requested the Science Advisory Committee in cooperation with the Federal Council "to review available studies and other pertinent information, and to report to me as quickly as possible on the specific measures that can be taken within and without the Government to develop the necessary and well qualified scientists and engineers and technicians to meet our society's complex needs."

Within a few months, the Panel on Environment and Incentives of the Standing Committee had prepared a report, *The Competition for Quality*. Part 1 of the report dealt with the effect of current salary levels on the Federal Government's ability to recruit and retain superior scientific and engineering personnel. An appendix contained documentary material showing the dimensions of the problem. This report was used in developing the Administration's legislative proposals for salary reform and was transmitted to Congress on July 12, 1962 in testimony of Civil Service Commissioner John W. Macy, Jr., before the House Post Office and Civil Service Committee. That year the Congress removed numerical ceilings on GS 16-18 positions.

Part 2 of the report, *The Competition for Quality*, dealt with non-salary factors affecting the selection, recruitment, development, and retention of superior personnel in the Federal Government, and was transmitted by President Kennedy with a memorandum to department and agency heads of May 13, 1962, instructing them to take "all practicable action" to implement the recommendations of the report. He instructed his Special Assistant for Science and Technology to report to him periodically on actions taken.

The Standing Committee's Panel on Environment and Incentives for Research was reconstituted into a Committee on Scientific Personnel in 1962 and continued as a separate committee until 1965 when its activities were transferred back to the Standing Committee.

(d) *Recommendations for effective implementation of Federal policies concerning administration and conduct of Federal programs.*

The 1959-62 report on Federal Council activities mentions involvement in a number of subjects on which Executive Office action was taken in the form of Presidential statements, PSAC reports, or Bureau of the Budget circulars and reports. However, the public record is obscure concerning the Federal Council role in the preparation of these documents. Consequently, one can only surmise that the subject references in the report relating to the following Federal Council's activities were relevant to published documents dealing with these topics during this same time period. These are tabulated below:

ACTIVITY	DOCUMENT
Conflict of interest regulations.	President's Memorandum of February 9, 1962, Preventing Conflicts of Interest on the Part of Advisers and Consultants to the Government.

ACTIVITY—continued

DOCUMENT—continued

- Establishment of governmentwide policy on indirect costs. Bureau of the Budget Circular No. A-21, Revised, January 7, 1961: Principles for determining costs applicable to research and development under grants and contracts with educational institutions.
- Establishment of governmentwide policy on institutional grants. Report of the President's Science Advisory Committee, November 15, 1960, entitled "Scientific Progress, the Universities and the Federal Government" which the Federal Council considered and unanimously recommended be made public.
- Problems in "quality control" over inhouse research and over assessment of proposals and monitoring of contract research. "Report to the President on Government Contracting for Research and Development" (the Bell Report) prepared by the Bureau of the Budget with acknowledged participation by several Federal agencies and the Special Assistant to the President for Science and Technology. By letter of April 30, 1962, the President transmitted the report to the Congress, noting that he had approved the report and had transmitted it to the heads of departments and agencies "for their guidance and action."
- Study and development of policies in scientific and technical manpower. Referring to the study begun in February 1962 by President's Science Advisory Committee in response to joint request to PSAC and the Federal Council by President Kennedy to examine the Nation's resources of scientific and technical personnel in relation to demands. The PSAC report, "Meeting Manpower Needs in Science and Technology" was published in December 1962 with the endorsement of the Federal Council.

ACTIVITY—continued

DOCUMENT—continued

Establishment of a new Governmentwide policy on allowances for page charges in Federal research grants and contracts.

In contrast to the above activities, where the Federal Council involvement was unclear, this subject was a Federal Council matter and details of the new policy were made public in a press release from the National Science Foundation, October 25, 1961, entitled "Federal Research Grants and Contracts to Allow Page Charges Under New Policy."

(e) *International aspects of science.*

The Federal Council established an International Committee in September 1959 upon the recommendation of the President's Science Advisory Committee. Five task groups explored aspects of international scientific activity, and a summary report, entitled "International Scientific and Technological Activities" was presented to the Federal Council, June 20, 1961. The recommendations in the Federal Council report were strongly endorsed in a September 4, 1962 report of the International Science Panel of the President's Science Advisory Committee, entitled "Research Support Abroad Through Grants and Contracts." Subsequently, the Council endorsed a statement, "Policy Guidance for Research Investment Abroad by U.S. Agencies" which reaffirmed the basic principles of the 1961 Federal Council report and the PSAC report.

The International Committee continued as a Federal Council committee until it was transferred to the State Department in 1973.

2. *The Council has utilized several avenues through which to translate recommendations into action.* In the preceding review of Federal Council activities during its first few years, we have seen that matters came to the Council from various sources:

- From one of its subject committees which had studied a problem and agreed on a coordinated approach and made recommendations thereon which committee members endorsed.
- From one of the member departments or agencies of the Federal Council.
- From the Special Assistant to the President for Science and Technology in his capacity as Chairman bringing up matters arising out of his interface within the Executive Office.
- From another unit in the Executive Office of the President such as the Bureau of the Budget or the President's Science Advisory Committee.
- From the President himself, requesting the Council alone or in concert with other units to consider a particular matter and advise him on courses of action.

The Federal Council utilized several devices by which to publicize its recommendations:

- Endorsement of reports made by its subject committees.
- Publication of reports made by subject committees as Federal Council reports.

- Promulgation of policy statements, for example, on page charges.
- Endorsement of reports of other Executive Office units, as for example, reports of the President's Science Advisory Committee.
- Reporting agreements in the record of Council meetings.
- Through release of such information to Congress as executive privilege permitted.

Section 10(d) of Executive Order 10807 stated unequivocally that the Federal Council shall be "advisory" to the President and to the heads of the Federal agencies and that nothing in the Executive order shall be construed as subjecting any agency, officer, or function to "control" by the Council.

Nevertheless, Federal Council recommendations for action became binding on Federal departments and agencies in a number of ways:

- Through voluntary consensus and agreement, if agencies believed it was in their own best interests to support particular recommendations.
- An ambiguous course of action on which consensus was unclear could be sharpened in the writing of the record of action. If the record was accepted, positions as reported therein became statements of agreed policy. Failure on the part of an agency to object was taken to imply acquiescence.
- Council recommendations channeled through directives of other Executive Office units became binding on all, for example, when promulgated through circulars from the Bureau of the Budget (Office of Management and Budget.)
- Finally, acceptance by the President of recommendations in a particular area and incorporation of them into a memorandum or other directive to all departments and agencies obligated all to observe them. A further direction to the Federal Council to report what measures have been taken by agencies pursuant to the Presidential directive provided a follow-up mechanism to prod agencies to action if they had not moved to do so on their own initiative.

A former Presidential science adviser has observed that Executive Office coordinating bodies are effective to the degree they are related to the President. Those chaired by the President, such as the National Security Council, are most effective, those by the Vice President less so, and so on. When the President-science adviser relationship was good, the Council was a more effective channel for moving those recommendations requiring Presidential attention upward, and, similarly, for assisting the President in assuring agency compliance with his directives, than it was when a gap appeared in the President-science advisory relationship. The former was the case during the early years of the Federal Council's existence—from 1959 into the early 1960's, but was decreasingly so as time went on.

The Federal Coordinating Council for Science, Engineering and Technology to be established under Public Law 94-282 will have only advisory powers, as did the former Federal Council. How it will be able to translate recommendations into action remains to be seen.

3. *The use of interagency committees has been a principal means for interagency program planning and coordination from the council's inception.* Six committees were established by the Council during 1959:

Standing; Coordinating Committee on Materials Research and Development; Interdepartmental Committee for Atmospheric Sciences; International Committee; Interagency Committee on Oceanography; and Technical Committee on High Energy Physics.

Two additional committees were established in 1961: Long-Range Planning; and Natural Resources, with a Subcommittee on Water Resources Research.

The establishment of a Committee on Scientific Information in May 1962 brought the total number of Federal Council committees to nine by the time the Office of Science and Technology was established. To date, the Federal Council has established approximately forty standing, ad hoc, or special committees, working groups, panels, or task forces.

4. *Direct Presidential assignments to the Federal Council constituted an important basis for action during the early years.* Recent Federal Council reports have been largely self-generated. Examples to support the former observation include the following:

President Eisenhower's statement of March 13, 1959, upon signing Executive Order 10807 noted that the report, "Strengthening American Science" had "pointed to a number of opportunities for advancing our total national program," and said, "I expect the new Council to consider and evaluate these opportunities and to encourage all Government agencies further to increase the quality of their efforts in these fields." The opportunities he had reference to were fields such as meteorology, oceanography, materials research, among others, which the report noted deserved greater attention. These were among the first subjects considered by the Council.

In a special message to Congress on natural resources in Feb. 1961, President John F. Kennedy stated that, pending receipt of a broad study of natural resources research from the National Academy of Sciences, he had directed his Science Advisor and the Federal Council to "review ongoing Federal research activities in the field of natural resources and to determine ways to strengthen the total government research effort relating to natural resources." The President called attention to this request in his special message to Congress on conservation on March 1, 1962, and again in February 1963 when transmitting a report on water resources research. The requested report was transmitted to the President in May 1963.

In January 1962 President Kennedy requested the Science Advisory Committee and the Federal Council to report "as quickly as possible" on specific measures both within and outside the Government to develop scientific and technical manpower to meet the Nation's needs. Both Council and PSAC reports in response to this request provided the basis for Presidential directives to department and agency heads to implement the recommendations.

5. *Interagency coordination over wide subject areas is a continuing process.* A majority of the committees established during the 1959-1962 period to deal with broad subject areas such as materials, atmospheric sciences, oceanography, international affairs, high energy physics, and water resources continued at least until 1969 and in three cases have continued to the present. In some areas, such as materials and oceanography, Federal Council committees were replaced by other coordinating bodies for an interim period but in recent years Federal Council responsibility has been resumed with the formation of new committees with relevant interests.

6. *The Federal Council as a "tent."* The comparison of the Federal Council to a tent to sit under while the concerned parties work out mutually satisfactory solutions to a common problem is an interesting analogy. It was made by Dr. Herbert York, Director of Defense Research and Engineering, and one of the original Council members, in an appearance on May 7, 1959, at hearings before the Senate Committee on Aeronautical and Space Sciences on governmental organization for space activities.⁵⁰ Although the committee was primarily concerned about the organization for space activities, including the new National Aeronautics and Space Council, it also sought information concerning the new Federal Council for Science and Technology and the relationship of the Special Assistant for Science and Technology to both councils.

Dr. York was asked whether there was evidence since its creation (less than two months earlier) that the Council had improved or would improve research and development planning. He advised patience; because of the high level of Council members and the distance between them and the "working level," he characterized the Council as "the kind of an organization that one should not expect very rapid results." He used the materials problem, which the Federal Council was looking into, as an illustration:⁵¹

. . . the results of any advances that came out of basic research in materials would be of interest to many of the agencies of the Federal Government. . . . The Federal Council is looking into the matter of what it can do in the way of getting better exchange of information.

That alone incidentally is quite a problem because the materials program consists of a very large number of small attacks on a great variety of problems.

It [the Federal Council] is a means for bringing together the persons concerned and giving them, so to speak, some kind of a tent to sit under while they are considering the problem of how best to coordinate and satisfy everybody's needs in materials.

Although the remarks were made with reference to one particular problem, the concept of the Federal Council as a "tent" or gathering place where mutual agreements on common problems can be worked out is believed to be applicable to the present role of the Council with respect to any problem it decides to consider.

CONGRESSIONAL PRESSURE FOR EXECUTIVE BRANCH SCIENCE REORGANIZATION

Congressional-executive branch relationships concerning the Federal Council and its authority during the initial period of the Council's existence were strained. The establishment of a science advisory office in the White House concentrated policymaking for scientific and technical activities. Because these activities were under the direction of a Special Assistant to the President who served in an advisory

⁵⁰ U.S. Congress. Senate. Committee on Aeronautical and Space Sciences. Investigation of Governmental Organization for Space Activities. Hearings before the Subcommittee on Governmental Organization for Space Activities of the . . . 86th Congress 1st session. Mar. 24-May 7, 1959. Washington, U.S. Govt. Print. Off., 1959, 762 p.

⁵¹ *Ibid.*, p. 583.

capacity, Congress was unable to obtain information which it felt it needed if it was to discharge its responsibility for legislative oversight over the Federal departments and agencies. When invited to testify, the Special Assistant declined because of his advisory status to the President. General oversight was a responsibility of the Government Operations Committees, and during this time the Senate Government Operations Committee was particularly concerned.

Since 1957 a Subcommittee on Reorganization and International Organizations had been investigating the need for Federal executive branch science reorganization. This investigation initially focused on the need for better management of scientific and technical information activities but this problem was subsequently identified as a symptom of a broader problem which concerned the overall organization for Federal scientific and technical activities. Initially legislation was introduced to create a Department of Science and Technology. Before hearings were held on this idea, the Federal Council for Science and Technology was established. Convinced that the Council was not the answer to the whole problem, the subcommittee modified later legislation to propose the establishment of a Commission on Science and Technology, to make a study of the Federal science organization and determine the need for further consolidation of activities. The Subcommittee on Reorganization and International Organizations continued to investigate the need for Federal science reorganization for several more years.

"SCIENCE ORGANIZATION AND THE PRESIDENT'S OFFICE"

In 1959 also, another Senate Government Operations Subcommittee was established to study Federal organization for foreign and defense policymaking. This was the Subcommittee on National Policy Machinery, under the chairmanship of Senator Henry M. Jackson. One aspect of its broad investigation was concerned with the organization of scientific and technical programs. Following hearings in April 1960 during which a number of prominent scientists gave their views, and after consultations with a number of other informed sources, and further subcommittee study, the subcommittee issued a report addressed to the problem, "Science Organization and the President's Office." The report⁵² reviewed the President's problem with respect to science, discussed the organizational response to this problem, and while recognizing its usefulness, pointed out inadequacies in the structure:

The President's science advisers have not yet fully occupied a "no man's land" in forward planning for science.

. . . The President's own science aides . . . have not been clearly charged with the initiative for sparking across-the-board forward planning. As a practical matter . . . they are not now staffed to handle the full span of scientific and technical planning problems requiring Presidential attention.

The science advisers have not yet done enough in helping the President and the Bureau of the Budget coordinate and monitor major government technical programs.

⁵² U.S. Congress, Senate Committee on Government Operations. Subcommittee on National Policy Machinery. Organizing for National Security: Science Organization and the President's Office. A Study. Washington, U.S. Govt. Print. Off., 1961. 7 p. 87th Congress 1st session. Committee print. pp. 7-8.

The President and the Bureau of the Budget, in auditing ongoing agency technical programs, now turn chiefly to the departments themselves in seeking technical counsel. Until recently, they also very largely relied upon departmental technical advice in coordinating activities cutting across agency lines.

The President and the Bureau, where major questions are at issue, can profit greatly by having a ready source of above-the-department technical advice. A President needs the protection of more than one channel of technical counsel. Also, departmental experts may become over-committed to their own agency program objectives. Program protagonists are not necessarily good program critics.

While the science advisers now give their chief and the Bureau of the Budget technical counsel in a number of areas, this Presidential-level staff assistance is needed on a broader front.

The Federal Council, as an instrument for assisting the President in monitoring agency programs, has been of only limited utility. It has worked under the limitations of all inter-agency coordinating committees of its kind. Where program stakes are high, and agency differences deep, departmental heads have traditionally tried to bypass Council-type mechanisms. The balance of bureaucratic power is weighted heavily against the Federal Council.

The President does not have enough full-time help from his science advisers.

. . . The Special Assistant . . . is the only science adviser who regularly works full time. . . . He needs more day-in day-out help.

The President's science advisers lack sufficient staff.

Today, a single staff of less than a dozen professionals serves the Special Assistant, the Science Advisory Committee and its many standing committees and panels, and the Federal Council. It has been hard pressed to stay on top of its steadily increasing workload.

Present arrangements create difficulties in Executive-Legislative relations.

As a personal Presidential adviser, the Special Assistant has not been available for testimony before Congressional committees. At the same time, he is the only Executive Branch official whose span of concern encompasses the full range of our government's scientific and technical programs. The Congress has thus been deprived of authoritative commentary on the government's scientific activities from an over-all, rather than departmental, point of view.

The remainder of the report contained a discussion of a new Office of Science and Technology within the Executive Office of the President which the Subcommittee recommended be established. The Office would be headed by the Special Assistant to the President for Science and Technology who would continue as a Presidential adviser and Chairman of the Federal Council. The President's Science Advisory Committee would continue in its "valued counselling role." The

duties of the new office were seen to be those assigned to it by the President but a suggestion was made that the office be given "formal" responsibilities in two areas: To make continuing recommendations for meeting long-term national needs in science; and "to help the President coordinate and evaluate agency programs by serving as technical counsellors to him and to the Bureau of the Budget."

The report touched on the role of National Science Foundation, the Bureau of the Budget, and even the National Academy of Sciences and National Research Council.

The section on duties concluded with a paragraph about the Federal Council:⁵³

The Federal Council for Science and Technology would continue to lend a hand in program coordination. Where the departments are in general agreement on program goals and agency assignments, the Council can help adjust lesser inter-agency disputes and encourage joint action by the departments. Also, the Council can be helpful in getting the word around and in serving as a clearinghouse for exchanging information about agency plans and programs.

These remarks indicate that the Subcommittee on National Policy Machinery saw only a secondary supportive role for the Federal Council. They represented a view of the Executive Office scientific coordinating body far different from the important role set forth for the Council in the PSAC report which had recommended its establishment and in President Eisenhower's message and Executive order which created it.

As this period in executive branch science organization is reviewed, similarities in the recent past are brought to mind. In the events leading to the establishment of the Office of Science and Technology, in the promulgation of the Reorganization Plan No. 1 of 1973 which abolished OST, and in the consideration of the recent legislation to reestablish an Office of Science and Technology Policy, the Federal Council received only brief consideration. However, the Council was continued through two major Executive Office reorganizations and the fact that it now has a statutory basis as a continuing body, attests to its indispensability.

THE KENNEDY ADMINISTRATION

A new President, John F. Kennedy, and a new science advisor, Dr. Jerome B. Wiesner, assumed their duties in 1961. Uncertainty concerning the disposition of the advisory arrangements which President Eisenhower had made was resolved by President Kennedy's decision to continue both the President's Science Advisory Committee and the Federal Council for Science and Technology. Since the basis for the former's creation was a Presidential letter and for the latter, an Executive order, a new President could easily have dispensed with both. But he did not, and the new science adviser testified that one of his first tasks upon assuming his new duties was that of improving the operation of the Federal Council.⁵⁴ Two immediate courses of

⁵³ *Ibid.*, p. 6.

⁵⁴ Testimony of Dr. Jerome Wiesner, Nov. 20, 1963, in U.S. Congress. House. Select Committee on Government Research. Federal Research and Development Programs. Hearings . . . 88th Congress 1st sess. Nov. 1963. Washington, U.S. Govt. Print. Off., 1964, p. 273.

action in support of this objective were first, to get policy-level people who also had technical understanding to serve as agency representatives on the Federal Council, and second, to recruit a technical assistant to have staff responsibility for the Federal Council.⁵⁵

Dr. Wiesner said he also asked the President's Science Advisory Committee to study the several different proposals which had been made to strengthen the top-level management of the Federal scientific establishment. On the basis of an intensive examination of possible alternatives, Dr. Wiesner said a decision was made to establish an office in the Executive Office of the President along the lines of the Office of Science and Technology which had been recommended in the 1961 report of the Senate Government Operations Subcommittee on National Policy Machinery, "Science Organization and the President's Office."⁵⁶

REORGANIZATION PLAN NO. 2 OF 1962 TRANSMITTED TO THE CONGRESS

President John F. Kennedy transmitted Reorganization Plan No. 2 of 1962 to the Congress on March 29, 1962, with an accompanying message. The plan consisted of three parts. Part I established the Office of Science and Technology in the Executive Office of the President, provided for a Director and Deputy Director to be appointed by the President by and with the advice and consent of the Senate, transferred certain functions relating to evaluation and coordination of Federal policies and programs from the National Science Foundation to the Director, and authorized the Director to make personnel appointments under the classified civil service. Part II defined changes in the National Science Foundation with respect to the Executive Committee of the National Science Board and the Director. Part III made provision for certain administrative matters.

The reorganization plan was referred to the Committee on Government Operations in each House. A disapproving resolution was introduced in the House for the purpose of setting in motion the procedure so that the House would be able to vote on the matter, described as of "vital" significance. All witnesses who appeared at hearings before the Subcommittee on Executive and Legislative Reorganization of the House Government Operations Committee supported the plan. Subsequently, the committee reported unfavorably on the disapproving resolution.⁵⁷ Reorganization Plan No. 2 was considered on the floor of the House on May 16, 1962, and by voice vote, the House agreed not to support the disapproving resolution.

No formal action was taken in the Senate on the Plan. The Senate Government Operations Committee held a hearing on May 10, 1962, on a pending bill to create a Commission on Science and Technology. Mr. Elmer B. Staats, Deputy Director, Bureau of the Budget, discussed the plan, answered questions concerning it, and offered to have prepared for the committee a report of actions taken within the Executive Office of the President in recent years, to demonstrate that progress in executive branch organization for policymaking had been made. Subsequently he submitted the report on the Federal

⁵⁵ *Ibid.*, pp. 273-274.

⁵⁶ *Loc. cit.*

⁵⁷ U.S. Congress. House Committee on Government Operations. Approving Reorganization Plan No. 2 of 1962 (Office of Science and Technology—National Science Foundation). Report to accompany H. Res. 595. Washington, U.S. Govt. Print. Off., 1962. 12 pp. 87th Congress 2d session. House Report 1635.

Council for Science and Technology for the 1959-1962 period, which has been referred to previously and has provided the basis for the preceding summary of Federal Council activity during its formative period.

FEDERAL COUNCIL ROLE UNDER REORGANIZATION PLAN NO. 2 OF 1962

Reorganization Plan No. 2 itself did not establish a formal link between the Federal Council for Science and Technology and the new Office of Science and Technology. Section 3(b) assigned the Director the task of assisting the President "as he may request with respect to the coordination of Federal scientific and technological functions and agencies."⁵⁸ However, this assignment referred to coordinating authority formerly held by the National Science Foundation which was hereby transferred to the Director, and was apart from the coordinating authority held by the Federal Council under Executive Order 10807. The President's message accompanying the reorganization plan defined the Director's coordinating responsibility more broadly: "... it is contemplated that the Director will assist the President in discharging the responsibility of the President for the proper coordination of Federal science and technology functions. . . ."⁵⁹

Further light on the anticipated Federal Council-OST relationship came from testimony of Deputy Budget Director Elmer B. Staats before the House Government Operations Committee on April 17, 1962. He said the reorganizations "do not contemplate any significant change in the basic mission and role of the National Science Foundation, the President's Science Advisory Committee and the Federal Council for Science and Technology." Later on, he restated this belief but omitted reference to the National Science Foundation. He said, "The organization and functions of the President's Science Advisory Committee and the Federal Council for Science and Technology are not affected by the reorganization plan, although staff services for the Committee and the Council will be provided by the Office of Science and Technology. Both the Committee and the Council have made unique and significant contributions to the formulation of science policies and the administration of science programs. . . ."

The analysis of the plan in the House Government Operations Committee report reflected its agreement with the position stated by the Bureau of the Budget for the Administration:⁶⁰

The President's Science Advisory Committee, established in the White House in 1957, is composed of non-Government scientists and engineers. The Federal Council for Science and Technology, established in 1959, is composed of Federal officials engaged in scientific and technical activities. The Committee advises the President on important developments in science and technology. The Council promotes closer cooperation among Federal agencies in planning their research and development programs and recommends ways in which the Federal Government can assist in advancing and strengthening the Nation's scientific effort as a whole.

⁵⁸ Ibid. p. 2.

⁵⁹ Ibid., p. 10.

⁶⁰ Approving Reorganization Plan No. 2 of 1962. Op. cit. p. 6.

Both the Advisory Committee and the Council are presently headed by the President's science adviser. The reorganization plan makes no change in either group and it is expected that the new Director of the Office of Science and Technology will become Chairman of them both.

REORGANIZATION PLAN NO. 2 OF 1962 GOES INTO EFFECT

Reorganization Plan No. 2 of 1962 became effective on June 8, 1962. The new Office of Science and Technology was established shortly thereafter. This event ended a three-year period during which the Federal Council had occupied a privileged status while located within and directed by the Special Assistant to the President for Science and Technology. As planned, the Federal Council was transferred to the new OST. Its chairman was still the Special Assistant who now had an additional title as Director. How the Federal Council for Science and Technology operated during the eleven-year period in which the Office of Science and Technology existed in the Executive Office of the President will be treated in the next section of this report.

V. THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY DURING THE EXISTENCE OF THE OFFICE OF SCIENCE AND TECHNOLOGY (1962-1973)

CURRENT RELEVANCE OF A STUDY OF THE 1962-73 PERIOD

The signing into law of the National Science and Technology Policy, Organization, and Priorities Act of 1976 on May 11, 1976, marks the beginning of a period which is reminiscent of that when Reorganization Plan No. 2 of 1962 became effective.

In both cases, the Presidential actions ended a period of congressional unease extending over a number of years.

In both cases, the President affirmed the need for having a science advisory office within the Executive Office but recognized that the head of this office must also be accountable to Congress.

In both cases, the need for an interagency coordinating body to be part of the mechanism was affirmed.

There are many other similarities. But the differences are of even more significance.

In 1962, Congress was presented with a reorganization plan on which it had only two possible courses of action: to approve or disapprove. It could not modify a single section or sentence nor could it add anything. Public Law 94-282, on the other hand, is an amalgamation of responses to address national needs as seen both by the President and the Congress. The original Presidential request for the establishment of a science and technology policy office has been acceded to, but Congress has with Administration acquiescence extended the legislation beyond Executive Office organization to other provisions which make it truly national in scope and significance. These include:

Title I which for the first time in the Nation's history sets forth a comprehensive statement of national policy for science and technology, linked to enumerated priority goals, and including defined principles, responsibilities and principles for implementation of this policy.

The assignment of important specific responsibilities to the Director of the Office of Science and Technology Policy in Title II.

The mandate in Title III to establish a temporary President's Committee on Science and Technology, within the Executive Office of the President, to conduct a survey of the overall Federal science, engineering, and technology effort including missions, goals, personnel, funding, organization, facilities, and activities in general.

The establishment of a new Federal Coordinating Council for Science, Engineering, and Technology by Title IV to replace the former Federal Council for Science and Technology.

The authorization of necessary funding to implement Titles II and III.

There is another important difference between the situation in 1962 and 1976. In the intervening period, the accumulated experiences, difficulties and lessons learned are at hand. If they are understood, perhaps they can keep history from repeating itself.

ESTABLISHMENT OF THE OFFICE OF SCIENCE AND TECHNOLOGY

The new Office of Science and Technology provided for by Reorganization Plan No. 2 of 1962 was established by the transfer early in July 1962 of the entire staff of the Office of the Special Assistant to the President for Science and Technology. President John F. Kennedy nominated Dr. Jerome B. Wiesner, who had been serving as his Special Assistant for Science and Technology since January 1961, to be the Director of the new office. At his nomination hearing on July 17, 1962, Dr. Wiesner noted that he had been serving as Acting Director, and that he had a staff of about 25 people, which included 12 technical scientific staff members. He said he thought the office might be increased to about 35 within the next year but that it would stay reasonably close to that level subsequently. He referred to his dual role: to act as confidential adviser to the President, and to provide overall coordination and judgment concerning the large and rapidly growing Federal scientific programs. He said his office would devote "considerably more attention to the coordination functions . . . than in the past." He mentioned the Federal Council as part of his office, noting that its composition tended to reflect the national problems.

During the course of the hearing, Dr. Wiesner demonstrated his dual role when he refused to answer a question relating to nuclear testing, explaining that it was "one on which I am a confidential adviser to the President."¹ Dr. Wiesner was confirmed to be Director, OST, on July 18, 1962.

On July 31, 1962, Dr. Wiesner made his first formal appearance before Congress as Director, Office of Science and Technology. At a hearing before the House Committee on Government Operations,² he went into some detail concerning the functions, organization, and interrelationships of the already existing President's Science Advisory Committee and the Federal Council for Science and Technology, noting that it was the President's intent to employ both instruments as "dual sources of advice" through the OST.

Heretofore, the Special Assistant had served as Chairman of the Council. Dr. Wiesner noted the intention of the Director to occupy this position. "By this means," he said, "the Council will be closely linked to OST so as to assist its Director in developing facts on inter-agency programs through the relevant Federal Council committees and reciprocally so in exercising the coordinating functions through these same Council committees."³

He emphasized that "neither OST nor FCST are interleaved between the President and his department and agency heads. Nor may these bodies interrupt the linkage of authority and responsibility that these officials have in carrying out their statutory missions and role. . . ."

¹ U.S. Congress. Senate. Committee on Labor and Public Welfare. Nomination. Hearing, 87th Congress, 2d session, July 17, 1962. Washington, U.S. Govt. Print. Off., 1962, p. 10.

² U.S. Congress. House. Committee on Government Operations. Systems Development and Management (Part I). Hearings before a Subcommittee of the . . . 87th Congress 2d session. June-Aug. 1962. Washington, U.S. Govt. Print. Off., 1962. 431 p. at pp. 139 ff.

³ *Ibid.*, p. 150.

Dr. Wiesner restated the delineation between individual agencies responsibilities and those of the Federal Council: ". . . while the authorized actions and operations of individual agencies constitute the mechanism for accomplishment of Federal programs, the Federal Council's responsibilities cut across all disciplines and agencies to facilitate development of programs that are coherent, consistent, and coordinated, to be sure that we have neither a plurality of fragmented programs nor a superposition of departmental aspirations."⁴

He concluded with a philosophical summary concerning Federal organizational change in general and placed the Executive Office science units within this context:⁵

Nobody in my opinion is wise enough to foresee all the effects of any organizational change at the Federal level, especially when one takes into account the effects of individual personalities. For this reason I think that it makes more sense for the Government to make organizational changes and arrangements in response to specific and clearly felt needs and problems rather than to attempt to mastermind the whole process and set up a radically new organization, whose efforts would in fact be completely unpredictable. The Office of Science and Technology and the creation of PSAC and the Federal Council are examples of evolutionary changes of the type required. We should create these institutions as we need them and measure their effects over a period of time. In time the pattern for more sweeping reorganization of Government science organization may become apparent.

Figure 2 shows the White House science structure after the establishment of the Office of Science and Technology and which continued until 1973.⁶

During the period the Office of Science and Technology was in existence, four science advisers served three Presidents.

	President	Special Assistant (Science Adviser)
January 1961 to November 1963.....	John F. Kennedy.....	Jerome B. Wiesner.
November 1963 to January 1964.....	Lyndon B. Johnson.....	Jerome B. Wiesner.
January 1964 to January 1969.....	Lyndon B. Johnson.....	Donald F. Hornig.
January 1969 to August 1970.....	Richard M. Nixon.....	Lee A. DuBridge.
September 1970 to February 1973.....	Richard M. Nixon.....	Edward E. David, Jr.
February 1973 to June 1973.....	Richard M. Nixon.....	Vacant.

Personalities, events, and circumstance all influenced the character of the President-science adviser relationship. Because the science adviser also was the Director of the Office of Science and Technology, Chairman of the Federal Council, and Chairman of the President's Science Advisory Committee as well as being Special Assistant to the President for Science and Technology, all units were affected as the President-science adviser relationship changed.

⁴ Loc. cit.

⁵ Ibid., p. 156.

⁶ Beckler, David. *Strategic Federal Decision-Making on R&D*. Research Management, v. 9, Sept. 1968, p. 321.

White House Science Structure

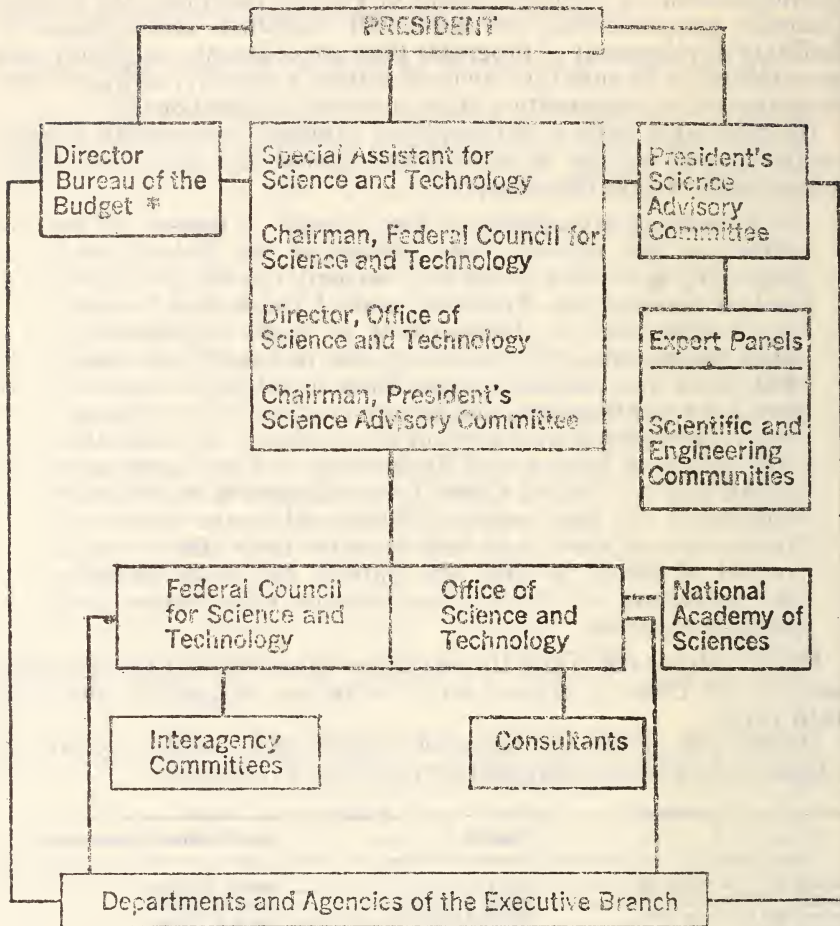


FIGURE 2.—White House Science Structure

The following sections review the highlights of Federal Council-OST interface during the different Presidents and science advisers.

THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY DURING THE KENNEDY ADMINISTRATION

PRESIDENT-SCIENCE ADVISER RELATIONSHIPS

President Kennedy was interested in and sympathetic to science, and how it and technology could be used in realizing national goals. In a message to Congress on May 25, 1961, President Kennedy asked the Congress and the Nation to commit itself to achieving several space goals, including the primary one, "before this decade is out, of

landing a man on the moon and returning him safely to earth.”⁷ Other space goals concerned acceleration of the nuclear rocket program, and the formulation of the communications satellite program, and the satellite system for worldwide weather observation. The realization of these space goals affected the distribution of America’s domestic resources during the decade of the sixties. NASA calculated that the cost of the first manned landing and return was an estimated \$21.35 billion through July 31, 1969. The Nation supported these costs because its position as a world leader had been challenged. The space program was an example of the use of science and technology in support of public policy.

Dr. Jerome B. Wiesner had worked with John F. Kennedy on his presidential campaign. After his election, Mr. Kennedy designated Dr. Wiesner to be his Special Assistant for Science and Technology, and also the Chairman of the Federal Council for Science and Technology, and after OST was established, nominated him to be the Director. The Kennedy-Wiesner relationship was close because the two men apparently understood each other and worked well together, and because science and technology were at that time important to national policy and the President needed advice at hand. This relationship was reported to be so close that “hardly a day passes that Wiesner does not talk to the President, either in person or by telephone.”⁸

Dr. Wiesner’s influence was believed to be so strong that Dr. Philip Abelson wrote in November 1963: “By any criterion the President’s Science Adviser, Dr. Jerome Wiesner, has been a major factor in decisions affecting monetary support of and organization of science. He and his associates have been in a position to dominate government decisions with respect to science. . . . Dr. Wiesner has accumulated and exercised more visible and invisible power than any scientist in the peace-time history of this country.”⁹

In a March 1963 appearance before a House Appropriations Committee subcommittee, on the FY 1964 budget for OST, Dr. Wiesner was asked about his function, and whether it was to advise the President or advise the departments and agencies. He denied doing the latter, except as he was requested by the President, but he said his office had spent “a great deal of time trying to establish coordination.”¹⁰

As a special assistant to the President, I, of course, do anything he will ask me to do, but we do not really do very much telling agencies what to do. We do a great deal of coordinating, or at least attempts at coordinating, in inter-agency programs. Prior to the existence of the Office one of the major criticisms that was made of the Executive Office management of Science and Technology, and it was made often, particularly by Members of the Congress, was that we made no attempt to make the various agencies that have programs that overlap coordinate their programs. We have

⁷ U.S. President. Urgent National Needs. Address. (H. Doc. No. 174). Congressional Record, vol. 107, May 25, 1961, pp. 8877-8882. At p. 8881.

⁸ Finney, John. New York Times Magazine, Sept. 3, 1961, VI, p. 8.

⁹ A Critical Appraisal of Government Research Policy. Robert A. Welch Foundation Research Bulletin, No. 14, November 1963, p. 5.

¹⁰ U.S. Congress. House. Committee on Appropriations. Independent Offices Appropriations for 1964. Hearings before a Subcommittee of the . . . 88th Cong. 1st sess. Part 2. Washington, U.S. Govt. Print. Off., 1963. p. 986.

spent a great deal of time trying to establish coordination. We generally do it as an interagency matter on a voluntary basis, and so far it has worked reasonably effectively.

Illustrations of OST activity in improvements in program coordination and administration involving the Federal Council were contained in prepared materials Dr. Wiesner presented to the committee:¹¹

The Office provided leadership and staff assistance in the coordination or agency programs in selected fields of science under the auspices of the Federal Council for Science and Technology. It has continued to emphasize the development of a national program in oceanography reflecting the interest and concern of the Congress. It has strengthened interagency planning in the atmospheric sciences, and has initiated a coordinated approach to research in the field of natural resources.

As part of the latter effort, the Office organized an intensive study of the Federal programs in water resources research, responsive to the desires of the Congress for a coordinated national program in this field. A report to the President by the Federal Council on this subject has been made public.

To illustrate the process of interagency coordination, a national oceanographic program is developed annually after interagency consideration of current and planned programs, mission requirements, scientific needs, manpower availability, and desirable balance of emphasis and funding levels. The plans are contained in reports submitted to the Congress.

(f) *Program administration*

The Office has taken the lead to strengthen the administration and conduct of research and development programs by the Federal agencies. It has initiated an interagency study of long-range planning of research and development. This study is aimed at assessing future requirements for funds, manpower, and facilities, in order to formulate criteria for their allocation and for the distribution of technical effort among the various agencies. The Office has examined certain administrative practices among the Federal agencies in support of research at the universities, and has examined the need for more uniform guidance for the development of agency grant and contract procedures.

The Office has backed up the work of the Federal Council in examining the salary and nonsalary factors affecting the attraction and retention of high-quality scientists and engineers in the Federal service and has worked closely with the Bureau of the Budget and Civil Service Commission in the development of the administration's salary proposals. It also assisted the Bureau of the Budget in its detailed study of Government contracting for research and development.

¹¹ *Ibid.*, p. 1001.

PRESIDENTIAL STATEMENTS CONCERNING FEDERAL
COUNCIL ACTIVITIES

The Public Papers of President Eisenhower for the 1959-1961 period contain only two references to the Federal Council,¹² A similar search of the Public Papers of President Kennedy turns up nine statements relating to the Federal Council. Five of these were before OST was established, four after. Five of the statements concerned Presidential task assignments to the Federal Council, alone or in concert with his Science Advisor and the President's Science Advisory Committee. The remainder represented Presidential actions in consequence of Federal Council recommendations or reports. They are summarized below. Full texts of all Presidential statements are found in Appendix J.

February 23, 1961—Natural resources research: Special message to the Congress on natural resources [Pending receipt of National Academy of Sciences study and evaluation of natural resources research, "I have directed my Science Advisor and the Federal Council for Science and Technology to review ongoing Federal research activities in the field of natural resources and to determine ways to strengthen the total government research effort relating to natural resources."]

October 12, 1961—Interdisciplinary materials research laboratories: Statement by the President announcing a contract for a materials research laboratory at the University of North Carolina. [Interdisciplinary laboratories established by Department of Defense on advice of Federal Council and President's Science Advisory Committee.]

January 15, 1962—Scientific and technical manpower: The President's news conference [on release of Nicolas DeWitt's book, "Education and Professional Employment in the U.S.S.R.," by National Science Foundation. Science Advisory Committee in cooperation with the Federal Council are requested "to review available studies and other pertinent information, and to report to me as quickly as possible on the specific measures that can be taken within and without the Government to develop the necessary and well qualified scientists and engineers and technicians to meet our society's complex needs—governmental, educational, and industrial."]

March 1, 1962—Conservation: Special message to the Congress on conservation. ["In response to the demonstrated need for concentrated and coordinated research this Administration has * * * directed the Federal Council for Science and Technology to coordinate the wide-ranging research programs of participating agencies to strengthen and unify our total governmental research effort in the natural resources field."]

May 13, 1962—Scientific and technical manpower: Memorandum on report "The Competition for Quality" by the

¹² One of these was the Presidential statement of March 13, 1959 upon signing the Executive order establishing the Council; the other was an incidental reference to the Council in a letter of Nov. 3, 1960 to Dr. Milton S. Eisenhower on the occasion of his resignation from two advisory committees.

Federal Council for Science and Technology [to department and agency heads] ["The Federal Council * * * has transmitted to me a report entitled 'The Competition for Quality' which sets forth steps urgently needed to assure competence within the Government establishment to carry out its program of scientific research and development. * * * The proposals I submitted to the Congress for pay reform * * * meet the recommendations contained in Part I of the report. In Part II the Council suggests additional steps that should be taken to develop a more favorable environment for science within the Government. * * * All practicable action should be taken to implement these recommendations." * * *]

December 13, 1962—Scientific and technical manpower: Statement by the President on the report of the President's Science Advisory Committee, "Meeting Manpower Needs in Science and Technology," ["The Federal Council for Science and Technology has reported to me that it concurs with the Committee's analysis on the priority of this need. They also have confirmed the soundness of goals and feasibility of the proposed program to meet these goals. I have requested that immediate consideration be given to this report in developing legislative and budget proposals which I shall submit to the Congress in January 1963."]

February 7, 1963—Health: Special message to the Congress on improving the Nation's health. [* * * "The President's Science Advisory Committee, in cooperation with the Federal Council for Science and Technology, has undertaken a major review of the Government's activities with respect to the use of chemicals in the environment. * * * If this review reveals need for additional authority, necessary recommendations will be made to the Congress."]

February 18, 1963—Water resources research: Letter to the President of the Senate transmitting a report on water resources research [* * * "The study on research in water resources is part of a comprehensive review of Federal research activities in natural resources. As indicated in my special messages to the Congress on natural resources and conservation in 1961 and 1962, the review is being undertaken by the Federal Council * * * at my direction, to strengthen and unify the total governmental research effort in the natural resources field."]

June 22, 1963—Natural resources research and development: Letter to the President of the Senate and to the Speaker of the House transmitting report "Research and Development on Natural Resources." [* * * "This study on natural resources is directly related to the study of coordinated water resources research which was also prepared by the Federal Council * * * the comprehensive review of which these studies are a part is being undertaken at my direction to strengthen and unify the total governmental research in the natural resources field. The current study provides the first comprehensive inventory of existing

natural resources research programs in the Executive Branch and indicates numerous opportunities for new research that would aid in assuring adequate supplies of raw materials, conservation of resources and preservation of a healthful and pleasing environment. * * * The Federal Council * * * will continue to provide policy level oversight and coordination in scientific and technical programs devoted to natural resources.”]

SUMMARY STATEMENT ON THE FEDERAL COUNCIL DURING THE KENNEDY ADMINISTRATION

Because of its scope and timing, the testimony of Dr. Edward Wenk, Jr., Executive Secretary of the Federal Council, before the House Select Committee on Government Research on November 19, 1963, provides a comprehensive picture of the operations of the Federal Council for Science and Technology during the Kennedy Administration, and during the period in which Dr. Wiesner served as science adviser.¹³

Early in November 1963, Dr. Wiesner had announced that he was resigning his science advisory posts to return to MIT in early 1964. President Kennedy designated Dr. Donald F. Hornig to be his successor as a Special Assistant for Science and Technology on November 7. Two weeks later, on November 22, the President was assassinated, and Vice President Lyndon B. Johnson became President.

Dr. Wenk had served as Executive Secretary of the Federal Council for more than two years at the time of his appearance before the committee and he continued in this position into mid-1964. His testimony provides some interesting insights which supplement information about the Council's operations already presented. The prepared statement is reproduced below.^{13a}

STATEMENT OF DR. EDWARD WENK, JR., EXECUTIVE SECRETARY, FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

FUNCTIONS AND OPERATIONS OF THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Mr. Chairman, members of the Select Committee on Government Research, I appreciate very much this opportunity to appear before your committee in the role of Executive Secretary of the Federal Council for Science and Technology, and to outline the functions of the Council as one of the key operational mechanisms that the President is employing in the fields of research and development for the planning and coordination of Government-wide programs and policies.

Points to be discussed

In the presentation that follows, I should like to review—

- (a) The Council's functions and organization;
- (b) The problems which the Council was established to meet;
- (c) Operating procedures and concepts;
- (d) Highlights of recent policy and program actions including some elaboration on coordination in oceanography; and, finally,
- (e) Some observations on problems in Government-wide planning and coordination that may bear on this committee's inquiry.

¹³ U.S. Congress. House. Select Committee on Government Research. Federal Research and Development Programs. Hearings . . . 88th Congress 1st session. November 18-22, 1963. Washington, U.S. Govt. Print. Off., 1964. Part 1, pp. 217-254.

^{13a} Ibid., pp. 240-250.

FUNCTIONS AND ORGANIZATION

The Federal Council for Science and Technology functions to consider problems in science and technology that affect more than one Federal agency and concerns the overall advancement of the Nation's science and technology. It is composed of the special assistant to the President for Science and Technology, one representative of policy rank of each of the following-named departments designated by the Department Secretary: Defense, Interior, Agriculture, Commerce, and HEW; the Director of NSF, the Administrator of NASA, and the Chairman of AEC or another member he designates. Official observers of policy rank also participate from the Department of State and the Bureau of the Budget, and more recently from the Federal Aviation Agency. The Chairman is designated by the President from among the members, and has historically been his special assistant.

Membership

The current membership includes:

Dr. Jerome B. Wiesner (Chairman), special assistant to the President for Science and Technology; Director, Office of Science and Technology.

Dr. Harold Brown, Director, Office of Defense Research and Engineering, Department of Defense.

Dr. John C. Calhoun, Jr., science adviser to the Secretary, Department of the Interior.

Dr. Willard Cochrane, Director, Agricultural Economics, Department of Agriculture.

Dr. J. Herbert Hollomon, Assistant Secretary for Science and Technology, Department of Commerce.

Mr. Boisfeuillet Jones, special assistant to the Secretary for Health and Medical Affairs, Department of Health, Education, and Welfare.

Dr. Leland J. Haworth, Director, National Science Foundation.

Mr. James E. Webb, Administrator, National Aeronautics and Space Administration.

Dr. Glenn T. Seaborg, Chairman, Atomic Energy Commission.

Official observers:

Dr. Ragnar Rollefson, Director, Office of International Affairs, Department of State.

Mr. Elmer B. Staats, Deputy Director, Bureau of the Budget.

Mr. N. E. Halaby, Administrator, Federal Aviation Agency.

Executive Secretary: Dr. Edward Wenk, Jr., technical assistant, Office of Science and Technology.

Dual role of Council

In fulfilling its functions, the Council serves a dual role. First, members of the Council, through its Chairman, serve as advisers to the President. Second, as senior officers at a level where they can commit their respective departments, members provide a direct mechanism for implementing Government-wide policies, programs and actions taken by the Council, related either to the administration or to the conduct of research and development. The objectives of such action are—

(a) To provide more effective planning and administration of Federal programs;

(b) To identify research needs including areas requiring additional emphasis;

(c) To achieve more effective utilization of scientific and technical resources and facilities of Federal agencies including the elimination of unnecessary duplication;

(d) To further international cooperation in science and technology.

Within this broad range, the Council has been highly selective in choosing topics for analysis or continued review. The Council has also sought to operate with a minimum of staff and of administrative superstructure, as well as with a minimum of procedural apparatus.

ORIGINS OF THE COUNCIL

In earlier testimony, Dr. Wiesner traced the rapid development of executive branch organization in the aftermath of 1957 Soviet successes in space technology. Immediate actions were ostensibly those of response to a new challenge.

In relation to policy planning, however, these actions gave heightened visibility and new expression to the impact which science and technology already had as instruments in the decisionmaking process. The Federal role in stepping up support for research and development both in the military arena and in space was clear.

The political and scientific setting in which such Federal support would expand posed two major sets of problems. The first set concerned intrinsic qualities of science and technology: the rapidly increasing complexity of scientific knowledge and sophistication of engineering developments; the blurring of traditional lines between disciplines; the importance of converting scientific results promptly and effectively; and the need to develop entirely new management concepts both in the support of science and in the development of weapon and space hardware systems. The second set of problems concerned whether the organization of Government could be sufficiently responsive and sufficiently versatile to meet newly evolving requirements. These two sets of difficulties were further related in view of the fact that fields of science and engineering do not correspond identically with Government departments. Rather than departments of physics, biology, or mechanical engineering, the Federal departmental structure is a direct reflection of the diversity of social, political, and economic objectives that characterize our society (although patterns often reflect historical rather than contemporary requirements).

The Nation was thus confronted with a paradox wherein historic Federal departmentalism tended to foster the independent formulation by each component of policies and programs unrelated to those of its coequals. Yet, in the application of science and technology to achieve its statutory mission, each agency was obliged to draw upon the entire pool of scientific information and resources that cut across all organizational boundaries. Without integration at the Presidential level, agencies could very well adopt policies in direct contradiction to those of other agencies, could compete harmfully with each other for scarce manpower, and could unwittingly undertake programs that might either duplicate or leave gaps in the fulfillment of national objectives.

The prompt establishment of the post of Special Assistant to the President in the White House shortly after Sputnik I, and the reconstitution of a Presidential Science Advisory Committee, represented significant steps taken to meet broad questions particularly of national security policy. But one of the early tasks of this Committee, reflected in their report of December 1958 entitled "Strengthening American Science," was an evaluation of the Government's capability to meet planning and management problems in science and technology.

This Committee noted that "considering the dimensions and complexity of its task, it would be surprising if the Government had devised the most effective ways and means for managing such a gigantic, varied, and complex program." The Executive Office of the President and the Bureau of the Budget had clear responsibilities to deal with governmentwide problems. Over the years, a number of councils, boards, and committees had also been appointed with this purpose, the latest up until then being the Interdepartmental Committee on Scientific Research and Development. None, however, operated with a combination of adequate authority, continuity, and technical expertise that would permit the attainment of broad objectives.

Guided by Presidential Science Advisory Committee recommendations, President Eisenhower in Executive Order 10807, dated March 13, 1959, established the Federal Council for Science and Technology to foster closer cooperation among Federal agencies so as to facilitate the solution of common problems, to promote a greater measure of coordination and otherwise improve the planning and management of Federal programs.

Shortly after he took office, President Kennedy designated Dr. Wiesner, who was his Science Adviser, as Chairman of the Council. Subsequently, they determined that its functions and activities should be strengthened. In the course of establishing the Office of Science and Technology under the Reorganization Plan No. 2 of 1962, the President indicated in his transmittal message his intent that the Council function as an arm of the OST to fulfill the objectives that lead to its original establishment.

At the present time, Dr. Wiesner as Presidential Assistant and Director of OST also serves as Chairman of the Federal Council and the PSAC, thus concentrating the focus of responsibility in a single office for both providing advice to the President and implementing his decisions. The Council continues to operate within the framework of the original Executive order, but its activities have

been sharply intensified and its scope of interest broadened. Perhaps most important as far as your select committee is concerned is the opportunity now afforded through the OST mechanism for enhanced communication between the Council and the Congress.

CURRENT OPERATING CONCEPTS AND PROCEDURES

It is important to remember that the authority, mission, and roles and responsibilities of individual departments constitute the predominant basis for accomplishment of Federal research and development programs, and should continue to do so. Each department, with its own special and complex requirements, must be free to sponsor imaginative and creative research if its development programs are not to become sterile. Some diversity in administrative style must also be expected. To insist that Government processes in all agencies be identical for the sake of administrative tidiness might seriously damage the effectiveness of the R. & D. operation. Nevertheless, a continuing process is required which facilitates integration of individual agency efforts under common policies, internally consistent and coordinated in execution.

In serving the President, the Council has this responsibility. If one thinks literally of a "fabric" of science and technology in Government, the strong vertical lines of authority and responsibility which lead from the President to a department head would represent the "warp" of that fabric. The horizontal lines of the Federal Council provide the "woof."

Consensus

Thus, in its mode of operation, the Council exists in an environment of departmentalism. It must thus operate to gain consensus. By and large its techniques, applied in the context of commonly developed fact, reflect the role of mediation and persuasion rather than executive direction. Both in substance and in its desire to meet common problems by joint action, this mode of Council operation has been facilitated by steps taken by this administration to establish posts for a policy level official in every agency who would be concerned with science and technology. By such action there are present at points of policy decisionmaking persons with scientific or engineering competence, with familiarity with Government, and with senior responsibilities. These benefits also flow into all of the scientific and technical activities of the agencies, while adding strength to the Council itself.

Meetings

The Council meets in plenary session at least once a month. Deliberations and actions are based on studies and recommendations generated by the Council's own committee[s] and panels, by PSAC, the National Academy of Sciences, the staff of OST, and by Council members themselves.

Matters to come before the Council generally fall into three categories:

(1) Development of Government-wide plans and programs in scientific and technical fields such as in oceanography and atmospheric sciences:

(2) Management of Federal programs, in which we consider efficient resource utilization and need to maintain program quality (i.e. issues in scientific manpower, in improving incentives and environment for retaining in-house competence) and

(3) Development of Government-wide policies, focused on the impact of Federal R. & D. on nongovernmental programs and institutions and on non-U.S. scientific programs (i.e., policies in support of oversea scientists.)

COMMITTEE STRUCTURE

The Council committee structure has been carefully devised to meet these three types of issues:

(1) Substantive programs: Committee on oceanography, atmospheric sciences, materials research and development, high energy physics, natural resources, water resources research, behavioral sciences.

(2) Program management: Panels on scientific personnel, on patent policy, on contractor evaluation; the Standing Committee, and committees on long-range planning and science information.

(3) Development of Government-wide policies considering interaction beyond the Federal establishment—International Committee: Panel on University Relationships With Federal Research Facilities.

The Standing Committee, prescribed by the Executive order and composed of scientist-administrators in the Federal services, is concerned primarily with in-house management issues and serves as a new medium of communication to all Federal laboratory heads and R. & D. administrative officials.

All of Federal science and technology is not coordinated by the Council. And it cannot be said that there is a comprehensive interlocking committee system built upon a carefully studied set of needs. Some committees have continuing responsibilities; others are ad hoc. The Council has even observed the unique experience in Government of having one of its committees recommend its own dissolution. In one sense there is a deliberate attempt to keep the number of committees to manageable proportions and thus not to drown in efforts to coordinate coordinators.

The Council a two-way channel of intramural communication

One important consequence of this Council structure is a two-way channel of intramural communication. Through this network of panels and committees, the individual members of the Federal Council, its Chairman and the President all have access to advice from over 300 senior officers in Government who combine subject matter competence with senior Government responsibilities. In this sense, the Council functions somewhat like PSAC and its panels. But, in addition these channels are exercised as a medium for implementing actions taken by the Council for the President in coordinating Government-wide programs.

As a further consequence of this committee structure, cross coupling and information switching develops at a number of echelons in the bureaucracy—at the policy level in the Council itself; at the next lower level represented by committee membership; and at senior working levels represented in panels.

One point that is often missed with regard to the Council's operation is the likelihood that participation by committee and panel members generally entails extra duty for busy agency executives. Most are senior officials in their agencies and cannot be relieved of other responsibilities to concentrate on Council matters. One associated problem is the lack of incentives for these activities by virtue of the widespread pattern of rewarding and recognizing individuals through their contributions to a parent agency, and not interagency activities. Yet, many of these participants distinguish themselves in developing new skills of effectively serving both their agency and the national interest, recognizing that in the long run, the interest of their agency is best served by maximizing cooperative capabilities in the attack on common problems.

COUNCIL SECRETARIAT

Executive Secretary

Staff assistance to the Council is provided by the OST through a full-time Executive Secretary who has responsibility for preparing and circulating an agenda in advance of each meeting, together with all relevant policy drafts or working papers. Each item can thus be reviewed before it arises, by being staffed out in the respective agencies, and by homework on the part of Council members. A record of each session is taken that sets forth actions and a precis of views that underpin consensus. These serve as memorandums of interagency agreement.

The Secretary also has the responsibility to follow up implementation of Council actions, and to arrange for transmittal to the Congress of materials approved for public release that set forth collective plans or activities of individual agencies.

Finally, the secretariat acts somewhat as a switchboard of information between Council committees, and a surprisingly high rate of return has been found by bringing modes of solutions of one committee or panel to the attention of other committees in dealing with apparently unrelated problems.

Other OST staff assistants

Apart from the Executive Secretary, other members of OST staff maintain part-time liaison with each Council committee and panel. In accordance with the Executive order, staffing of the committees and panels themselves is ordinarily provided by personnel associated with the committee chairman's agency. While such staff assistance is usually part time, the scope of activities in the case of oceanography, atmospheric sciences, water research, and science information has warranted full-time appointments.

RECENT POLICY AND PROGRAM ACTIONS

Although details of Council actions are set forth in separate topical reports, such widespread interest has evolved in the Council's overall activities that a 1962 annual report has been made available to the Congress. A copy of the report is herewith submitted for the record.

Content of 1962 report

This annual report summarizes policy and program actions in 1962 as follows:

1. Federal recruitment and retention of talented staff.
2. Problems in control over quality of federally managed research.
3. Policy guidelines on U.S. support of oversea research.
4. Long-range Government-wide planning.
5. Scientific manpower and education.
6. Policy on release of research-grant information.
7. Oceanography.
8. Atmospheric sciences.
9. Materials research.
10. High energy physics.
11. Natural resources.
12. Science information.
13. Water research.
14. Fire research.

Details of committee functions and activities are provided in an appendix. Also listed are a series of reports which were published or cleared for release during that interval.

The FCST will prepare an annual report for calendar year 1963 that will be transmitted to the Congress shortly after the first of the year. In the meanwhile, the Council has reviewed for public release and transmittal to the Congress, the following reports:

Published FCST reports

"National Plan for Ocean Surveys" ICO pamphlet No. 7, May 1963.

"Bibliography of Oceanographic Publications," ICO pamphlet No. 9, April 1963.

"Oceanography—The Ten Years Ahead," a long-range national oceanographic plan 1963-72, ICO pamphlet No. 10, June 1963.

"National Oceanographic Program, Fiscal Year 1963." ICO pamphlet No. 11, April 1963.

"Oceanographic Ship Operating Schedules, Fiscal Year 1964," ICO pamphlet No. 12, May 1963.

"University Curricula in Oceanography, Academic Year 1963-64," ICO pamphlet No. 14, June 1963.

"Coordinating Committee on Materials Research and Development—Progress Report," September 23, 1963.

"Research and Development on Natural Resources," May 1963.

"Federal Water Resources Research Activities," report to the President on water resources research, February 11, 1963, printed by the Senate Committee on Interior and Insular Affairs, March 24, 1963.

"Statement Relating to the Release of Information on Grants or Grant-Type Contracts Made in Support of Nonclassified Basic Scientific Research at Non-profit Institutions," February 11, 1963.

COORDINATION IN OCEANOGRAPHY

In order that your committee may gain a more intimate knowledge of Council operations, I should like to outline in somewhat greater detail the example of Council coordination in the field of oceanography.

In the first instance, the Council has been highly selective in determining which multiagency activities should be identified as national programs and made the responsibility of a Council committee. Criteria for such selection to avoid proliferation of committees have generally been—

(a) Fields of research whose growth and stimulation are deemed urgently needed in the national interest;

(b) Multiagency performance of these programs, whose components are undertaken within statutory authority of a number of different agencies.

In several cases, the President has specifically requested the Council to assume responsibility for developing a national program; in others, the Council took action on the basis of staff studies, including those by the National Academy of Sciences.

The program in oceanography was one of the first to be so delineated and on the basis of its maturity and widely acknowledged accomplishments is an example we are following to develop the potential for a coherent and integrated program in other areas.

The Interagency Committee on Oceanography was established in 1959 to guide Government-wide development in an important field that had long been in a comparatively primitive state with respect to resources, activity, and scientific results. With the completion of a major study by the National Academy of Sciences, and with the widespread conviction that the national interest demanded more rapid growth, program needs have been carefully evaluated; during the last 3 years, accelerated support is bringing oceanography to a level compatible with other fields of science whose well-being has developed more spontaneously.

The ICO has reached a stage in its development where (1) each year a single national program is defined, including formulation of an integrated Federal budget, broken down by agency and by function; (2) annual increments are matched to a long-term plan which includes a statement of national goals, of the various roles of the Federal agencies that would be charged with achievement of these goals, and of resource requirements in terms of facilities, ships, and manpower; (3) techniques have been developed for examining and evaluating agency programs to establish optimum level of support and balance between fields; (4) program components are reviewed to minimize both unnecessary duplication and gaps vital to the total effectiveness; (5) focal responsibility is assigned to groups or agencies in order that these gaps be promptly and effectively remedied; (6) the collection of oceanographic data is standardized and centralized at an interagency National Oceanographic Data Center; (7) planning is coordinated for use of facilities so that every possible advantage can be taken by one agency in utilizing facilities of another, especially through advance publication of ship operating schedules; (8) manpower requirements and of needed educational and training programs are coordinated to assure adequate supply, and a catalog of nationwide curriculums published; (9) advisory committees and consultants are utilized to obtain the counsel of scientific leaders in the field, users of Government supplied research facilities, and engineers and industrialists concerned with the ever-growing utilization of new instruments and data gathering facilities; and (10) planning staffs from major participating agencies share office, laboratory, and dockside facilities.

The ICO operates through panels on research, surveys, training and manpower, ships, instrumentation and facilities and international programs.

Both the annual and long-range programs incorporate the ICO's best judgment as to goals, quality content of programs, rate of growth, and relative emphasis. To prepare these programs, the ICO reviews proposals of individual agencies in the context of each agency's mission, in the context of national goals and in the context of long-range targets and opportunities of science which have been identified through independent studies conducted through the scientific community.

These plans are next evaluated by a PSAC-type panel of consultants in which, to some extent, the ICO plays the role of advocate and the consultants the role of critic. Parenthetically, we should note that these roles are more frequently reversed. Nevertheless, we have found that a very fruitful expansion occurs in agency perspective, largely from the interaction between those in Government who have the day-to-day responsibilities of administering broad programs, and those outside of Government who have the opportunities to visualize the longer range investment potential.

As a third step, the ICO proposals together with the consultants' critique are submitted to the Council members for their own review and analysis. With subsequent Council endorsement, either as proposed or amended, the national program serves as a guide to both the Bureau of the Budget and to the individual agencies in the development of the President's budget.

Inevitably, in the course of this distillation process, changes occur both in program content and level. What evolves, however, has for the last 3 years been published and made available to the Congress for its consideration when budgets of the individual agencies are reviewed through the appropriations subcommittees having jurisdiction. I should note that we anticipate a serious appropriations problem in oceanography this year. The President proposed \$156 million for fiscal year 1964 to continue healthy growth in this activity, compared to \$124 million for fiscal year 1963. There is some possibility that the total for fiscal year 1964 may be even less than for fiscal year 1963.

As a final detail regarding Government-wide efforts in oceanography, I should like to call attention to the "Long-Range National Oceanographic Plan, 1962-72" that was released by the Federal Council in June. The study that led to this report is one of the very first in which broad national goals were identified. These are expressed here in terms of the potential which oceanography contributes: To national defense, to the development of fish and mineral resources in the world ocean, to the exploitation of resources on and under the Continental Shelf, to the protection of health from inadvertent pollution of the ocean, and of life and property along the coast, and, finally, through the study of the oceans, to heightened knowledge of the universe itself—whether in terms of its origin, the ways of life in the sea, the motion of the waters, or the interrelationship of ocean with atmosphere and the effects on weather. The plan also established targets with regard to the rate at which the program could grow without loss in quality; an assignment of roles of different agencies who participate, with suggested changes in their programs that are more than a simple linear extrapolation of present activity. The long-range plan also took into account the rate at which trained manpower may be expected to grow over the next decade, considering demands by other fields of science and engineering, and the balance which is required between ships, shore facilities, and manpower to maximize accomplishment.

A great deal was learned from the exercise, including the recognition that such planning is exceedingly complex, that such plans should not be rigid blue-prints to be followed slavishly, that broad outlines must be supplemented by additional satellite studies that develop greater technical detail. Finally, completion of this long-range projection reflects an important step in the commitment of this Nation to a new era in the exploration of the universe—for by our programs in outer space and by these programs in oceanography, we have embarked on a new kind of "Lewis-and-Clark" expedition. With space exploration, the technical and management problems differed so radically from any precursor that a new agency was established for its development. In the case of oceanography, however, we are moving deliberately to the same end, but endeavoring to employ and revitalize existing instruments of Government that have had historical roots and interests in the sea, and for whom research is essential to accomplishment of their own agency's mission. This diversity of interest is the fundamental basis for ICO operations:

The ocean is a potential military arena which, in an era of undersea warfare, requires understanding by the Navy to assure that this Nation maintains its present military control of the sea; the Bureau of Commercial Fisheries must inventory marine life, understand factors promoting growth and distribution of fish stocks, and develop techniques that will improve the effectiveness of a catch; the Bureau of Sports Fisheries and Wildlife has a concern for the conservation of our living resources as well as their development for recreational purposes that now have become such a vital part of American life; the Geological Survey and the Bureau of Mines have interests in determining the presence of mineral resources on or below the ocean floor and means by which these can be exploited when the world demand for minerals makes such exploitation not only desirable but urgent. The Coast and Geodetic Survey has an important task in surveying the oceans, and measuring bottom topography, currents, temperatures, gravity and magnetic fields. The Weather Bureau seeks to understand how the ocean behavior influences weather and climate.

The AEC must understand the ocean environment in order that it may safely deposit low-level radioactive waste in the oceans without risk to life. And the Public Health Service has a corresponding obligation to study the possible effects of these and other pollutants, especially on fish and other marine life of the sea which form part of the human food chain. The Coast Guard is responsible for protecting life and property at sea that requires an understanding of storms and iceberg hazards, and the Beach Erosion Board of the Army maintains a corresponding interest in the harmful effects of waves on our shores. The Smithsonian and the National Science Foundation have exceedingly vital roles in relationship to the broad understanding of the oceans without concern for the particular purpose by which such understanding will be applied. All of these agencies have significant roles to play in this exploration of the sea; and the ICO is developing a viable and coordinated research and survey program to a common end.

AN ANALYSIS OF GOVERNMENT-WIDE PLANNING AND COORDINATION

Mr. Chairman, I should like to add a few general observations concerning the Council, its dynamics, its strengths and its limitations. In the first instance, no committee—in fact, no single organizational device—can be a panacea for

interagency ailments. Many particular problems yield most effectively to informal liaison; some to formal bilateral agreements. Solutions to fragmented or diffuse authority may lie in concentration of authority in one agency serving as a delegated agent. Effective scientific communication occurs even without formal mechanisms.

Difficulties of interagency coordination

The Council was proposed as an experiment to meet growing problems of coordination, but in no way is it expected to encompass all activities in the domain of science and technology. Whether perfect or imperfect in conception, the test of effectiveness for this instrumentality lies mainly in the mode of its employment. Success or failure is in turn heavily dependent on a network of interpersonal relations and mutual trust, on the attitudes of cooperation amongst members, on the shadow of Presidential authority, and on the interests and leadership of the Council and Committee Chairmen.

We must remember that the events and circumstances that surround the birth and growth of our individual departments may not foster any great incentive for cooperation. Departmentalism cannot—nor should—be extinguished by an Executive order. For out of the strong lines of agency authority and responsibility stem the wellsprings of vitality; and there is no substitute for competence within the formal line structure of Government. In the competition for limited funds, most forces are centrifugal. The larger agencies often find that living alone is so rich and rewarding that living [with] other agencies is not essential.

Benefits of interagency coordination

Yet, there is a new perspective in developing scientific and technical advice as a crucial aid to informed Presidential decisionmaking. Also, agencies must increasingly draw on a common pool of scientific research often enriched by contributions from their neighbors; all agencies must draw on the same base of skilled manpower, and deal with the same non-Federal institutions. In this context it has become evident that the problems that unite the agencies through the Council are at least as great as the problems that divide them.

Affirmative incentives exist at the Committee level. We have found that this Council mechanism affords an opportunity for a Government-wide group to evaluate the merits of program elements that have failed to gain support within agencies—and thus provide an opportunity to bring meritorious cases back to the agency for a second review. Opportunities must, in fact, be afforded for advocacy of national programs—in view of the fact that their stimulation is in the national interest, yet their development is not a jurisdictional matter of one agency or committee.

Under this administration, the Council has met frequently enough and members have found sufficient encouragement to air their views candidly, especially to sharpen differing points of view, that in the very least, an atmosphere of unity has spawned tangible acts of interdepartmental cooperation.

Such tendencies toward harmony, coupled with a deliberate intent to minimize aimless discussion through energetic advance preparation, lead to a good record of completed action. But with these benefits in the form of efficiency and teamwork, there may be inadvertent sacrifice of spontaneity and creativity.

Index of effectiveness of Council

In appraising performance of the Council, it is possible to construct a scale or index of effectiveness, with different degrees or kinds of activity, in ascending order of difficulty.

The obvious, but not necessarily prevailing, starting point in such a scale is the interagency exchange of information on current plans. This process may find expression through an inventory of ongoing work, followed by an analysis of possible duplication or gaps, and thence of quality of program content. Virtually all of the Council's substantive committees begin interagency life on such a platform of agreed-upon fact. But even this beginning is difficult to achieve because of problems in commonly accepted definitions, with differing categorical subdivisions that suit different agency needs.

Next comes the development and understanding of common goals toward which Government-wide policy and program planning should be directed. Related to this activity is the preparation of staff studies setting forth policy alternatives together with an evaluation of their consequences.

Third is the communication among agencies of their future plans. Such activity assumes meaning only if these plans are expressed in substantive as well as budgetary terms, an assumption that is not yet widely realized either in theory or practice.

Fourth in this scale of interagency coordination is the act of both planning ahead and planning together—of developing Government-wide program targets, consonant with Government-wide objectives, of comparing the aggregate of individual agency plans with these targets, and collectively agreeing to amend individual plans to fill gaps, eliminate unnecessary duplication, plan for joint use of specialized facilities.

The highest potential level of Council activity lies in the agreement to assign or reassign major projects of individual agencies so as to optimize the effectiveness of the group. In some instances, this might be accompanied by transfer of funds, or offers to reduce involvement in areas where another agency commits itself to fulfill a joint need. By no means has the Council advanced to this highest index of accomplishment in all of its actions. Its Committees vary in maturity, in vigor and effectiveness. The ICO is certainly the Council's model for interagency planning and much credit for its success derives from the leadership of Secretary James H. Wakelin, its Chairman. In addition, perceptive interest on the part of the Congress has certainly been most constructive. From this experience it is clear that such accomplishment is possible only if cooperation develops at the working level as well as at policy level; yet, no formula exists for instant success. The time scale for progress must be measured in years.

Some political scientists would use the record of successful adjudication of interdepartmental disagreement as the test of a Council's ultimate effectiveness. In the environment for public policymaking, where interests inevitably conflict and collide, persuasion, and accommodation are traditional methods for reaching agreement. In our form of government, these have a high expectation of durable success. Thus in the Council, group discussion, including contributions by members who are not parties to a dispute, is sought as the main route to a meaningful solution. Seldom, if ever, does the Council make a decision where there is conspicuous reluctance by any member to resolve differences. But rather than have its Committees settle issues on the basis of the lowest common denominator, the Council has asked that recommendations from deadlocked committees be transmitted to the Council, with identifiable dissent if it remains. The Council has then worked deliberately and patiently to achieve agreement by repeated confrontation for a second or third try at breaking stalemates. Persuasive encouragement by the Chairman, as the special assistant to the President, has been a key to resolution of the few deep-seated conflicts.

PROBLEM AREAS

Preservation of budget integrity of Government-wide programs

The Council as a whole has encountered certain recurring problems that yet remain unresolved. The most serious of these is the preservation of budget integrity of Government-wide programs, adopted or endorsed by the Council. Dislocations occur, both during the last minutes of budget preparation in the executive branch, and again when evaluated by the different committees of the Congress in the appropriations process. In the executive branch, after a coherent and well-balanced program is approved by the Council involving 10 or 20 agency components, one or more elements may lose out under budget ceilings in the competition with other programs within the agency involved. Precautions undertaken in the Executive Offices to prevent such occurrences involve preparation of both agency and Government-wide targets by Council Committees, and their timely communication to departmental heads and to the Bureau of the Budget, so that the consequences of such budgetary constraints are anticipated.

Disintegration of inter-agency programs in Congress

As has been noted, there is also a tendency for carefully prepared interagency programs to fall apart in the Congress because of evaluation only on an agency by agency basis. The Office of Science and Technology supported H.R. 6997, requiring an annual report in oceanography, in part because of the expected benefit of such legislation in developing an appropriate congressional mechanism for dealing with such a complex, Government-wide problem area. Perhaps experience with this precedent will suggest relevance to other fields of science as well.

Starting new programs

Another problem that the Council faces is the stimulation of new activities that are essential to completing the balance of a broad program, but which do not fall naturally within the jurisdiction or historic interest of any single agency. Starting something new often means stopping something old—and this problem is one that will become increasingly critical as budgets tighten.

Staffing of committees

The Council also faces a serious problem in staffing its committees. For various reasons, we have discouraged the evolution of large permanent staff. Yet, as the scope and depth of activity increases, technical staff are needed to draft policy papers, analyze program alternatives, develop criteria for their evaluation, and to lead ad hoc studies. Additional administrative staff are also being required to meet intensified public interest associated with increased Council visibility. In the case of oceanography, inquiries now exceed 100 letters or phone calls daily. Because many of the Council's responsibilities focus on Government-wide issues in basic research, scientific manpower, and scientific information, the Council must look to NSF for assistance in areas where that agency has statutory responsibility to develop both statistics and policy proposals. On a broad basis, however, some expansion in technical and administrative personnel is required. Difficulties in finding sponsorship of additional staff, much less their recruitment, may prove serious barriers to effective operation of some of these Committees.

Council a pioneering tool in science management

In closing Mr. Chairman, I should like to remind the committee that we still regard the Council as a pioneering tool in science management. We have much to learn about its potential and about its limitations. A strong and viable departmental structure is the essence of effective action. Related problems in policy and program coordination in our Government probably arose as soon as the second Federal department was established. Many rivalries are long standing and extend beyond the area of science and technology; their solution may well be found outside the Council. Nevertheless, the process of mobilizing science and technology in the context of a nonauthoritarian environment of a democracy is an important and exciting challenge to our ingenuity. I am pleased to have this opportunity of sharing with the committee some of the recent results.

INTERIM REPORT ON ACTIVITIES DURING CALENDAR YEAR 1963

An Interim Report on activities of the Federal Council during 1963 was issued by OST in February 1965. It was later incorporated into a full report for 1963 and 1964.¹⁴

The Interim Report supplemented the listing of reports in Dr. Wenk's statement to include the following: "Status Report on Scientific and Technical Information in the Federal Government", June 1963; "Standard for Descriptive Cataloging of Government Scientific and Technical Reports", December 1963; "National Atmospheric Sciences Program, Fiscal Year 1965", (ICAS Report No. 8 of October 16, 1963); Memo (Betts to Fleagle), 2/4/64—Revised Data for ICAS Report No. 8; "Proceedings First Symposium: Current Problems in the Management of Scientific Personnel", October 17-18, 1963.

The Interim Report contained additional information on committee activities in several areas, namely, oceanography, atmospheric sciences and natural resources (activity was most intense in these areas), also materials research, and high energy physics facilities, long-range planning, science information, science manpower, and international activities. It noted that during 1963, activities were initiated in three additional areas: transportation research, with the formation of an ad hoc Council panel; patents, with the establishment of a Patent Advisory Panel; and in accepting the 1962 recommendations in the report of the President's Science Advisory Committee on strengthening the behavioral sciences, the Council appointed a new Committee on Behavioral Sciences.

Table 3 shows the Federal Council committees and panels which were established from 1959 through 1963.

¹⁴ The Role of the Federal Council for Science and Technology; Report for 1963 and 1964. Washington, U.S. Govt. Print. Off., 1965, 53 p.

TABLE 3

FEDERAL COUNCIL COMMITTEES AND PANELS, GROUPS, ETC.	1959	1960	1961	1962	1963
1959- 1963					
Standing Committee (From 1967-- Committee on Federal Laboratories)	E	*****			C
Technical Committee on High Energy Physics	E	*****			C
International Committee	E	*****			C
Coordinating Committee on Materials Research & Development	E	*****			C
Interdepartmental Committee for Atmospheric Sciences	E	*****			C
Interagency Committee on Oceanography	E	*****			C
Committee on Long-Range Planning			E *****		C
Committee on Natural Resources			E *****		C
Subcommittee on Water Resources Research			E N 1/		
Committee on Water Resources Research				E	C
Committee on Scientific Information				E *	C
Committee on Scientific Personnel				E *	C
Ad Hoc Panel on Transportation Research					E *
Patent Advisory Panel					E
Committee on Behavioral Sciences					E

Legend: E = Established
C = Continuing
M = Merged
A = Abolished
T = Transferred

1/ Merged into a new Committee on Water Resources Research

THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY DURING THE JOHNSON ADMINISTRATION (1963-1969)

PRESIDENT-SCIENCE ADVISER RELATIONSHIP

Vice-President Lyndon B. Johnson suddenly became President on November 22, 1963, amid a national shock which continued into 1964. One of the new President's first acts was to request all members of the Kennedy staff to remain. Most of them, including Dr. Donald F. Hornig, who had been named earlier in November by President Kennedy to succeed Dr. Jerome Wiesner as Special Assistant for Science and Technology, complied. In January 1964 President Johnson nominated Dr. Hornig to be Director of the Office of Science and Technology; the nomination was confirmed and Dr. Hornig was sworn in as Director and as Special Assistant to the President for Science and Technology on January 24.

In nominating his predecessor's selection to be his Special Assistant for Science and Technology and in retaining PSAC, FCST, and OST, President Johnson in effect endorsed the science advisory apparatus instituted by two previous Presidents.

Although he retained Dr. Hornig in his multiple science advisory roles and made no organizational changes in the institutional setup except to enlarge the Federal Council membership, President Johnson operated in a different style from his predecessors and used these mechanisms differently over the five years he was in office. The difficulties which arose have been attributed to differing personalities and to differing concepts of what the role of scientific and technical advice should be in the Executive Office of the President.

Unlike his predecessor who maintained a "casual, almost family-like" relationship with his White House aides, including Dr. Wiesner, President Johnson preferred "a more formal and businesslike" working environment.^{14a} He had a select group of confidants, but Dr. Hornig was apparently never in this group. Dr. Hornig had worked with Mr. Kennedy during his Presidential campaign but he purportedly had only a "nodding" acquaintance with Mr. Johnson before coming to the White House. Nevertheless, it appears that the President turned to him for advice on a wide range of problems. Although reportedly not the "political" type, the fact that he lasted in an intensely political environment suggests otherwise. Nearing the end of his fourth year, Dr. Hornig commented that he had come with "strong personal convictions about what needs to be done." However, "once you are on the inside," he said, "you soon learn the hard political facts of life. Early in the game you find out that you have to compromise some things you thought might be nice to do for the things you know have to be done. Then, too, you are exposed to an entirely new set of problems which need attention—problems you were not aware of on the outside."¹⁵

Of the institutional units within the Executive Office, the President's Science Advisory Committee encountered the most serious differences of opinion with those of the President. Dr. Hornig summarized the difficulty in an October 1973 meeting of all Presidential science

^{14a} White House Superstructure for Science. *Chemical and Engineering News*, v. 42, Oct. 19, 1964, pp. 78-92.

¹⁵ Science Adviser Hornig Discusses His Job. *Chemical and Engineering News*, v. 45, Nov. 27, 1967, p. 21.

advisers, and his comments indicate that he understood that even scientific advice to the President must be politically oriented to the needs of the President:¹⁶

There are some more subtle factors involved in the changing role of P.S.A.C. with respect to the military, too. There is nothing sadder than an adviser whose advice isn't wanted. During World War II and at the time of Sputnik, there was a clear identity of interest between the scientific community and the President. The President knew he needed advice, and the country knew he needed advice; and under Killian a heroic role was played. As time went on, quite aside from the building up of scientific expertise in the Department of Defense, attentions turned to other things; the most urgent political items were no longer quite so closely allied with the things P.S.A.C. was interested in. And in fighting its own personal battles, P.S.A.C. came to be regarded, rightly or wrongly, as having its own political positions. In the beginning there was an identity of interest between the President and P.S.A.C.; the President knew that even if P.S.A.C. disagreed with him, even if it disagreed with some of his other principal advisers, basically P.S.A.C. members identified with him as his scientific advisory committee. Later I believe that this feeling was eroded.

[Dr. Wiesner interjected at this point, "I remember when I had to go to President Johnson and explain that P.S.A.C. disagreed with his views on the Vietnam war."]

Dr. Hornig continued:

Yes, there is no question that P.S.A.C. came to be regarded as not having an identity of interest with the President. And it seems to me that in many respects this parting of the ways was related to our own inability to be critics and nevertheless be part of the team at the same time.

When we talk about giving him scientific advice, it seems to me we must remember that the President of the United States is two different kinds of people—a political leader and a chief executive. And really we talk about two different kinds of problems, and the solutions will undoubtedly be two different kinds of solutions. There is the kind of advice that Killian talked about—that the political leader needs in orienting himself. And then there's the more detailed kind of advice that the Chief Executive needs in running this country. Some of us forget that a large part of the relationship of the President and the science advisers—or any other groups—depends upon the personal interest and characteristics of the President and his method of operation—particularly with the staff people who are around him.

FEDERAL COUNCIL ROLE BASICALLY UNCHANGED

Throughout the period during which Dr. Hornig headed the Executive Office science advisory apparatus, the Federal Council for Science

¹⁶ Science Advice for the White House. *Technology Review*, v. 76, Jan. 1974, p. 8-19.

and Technology continued to function much along the lines which had been established earlier. Dr. Hornig was designated Chairman. Unlike the requirement in P.L. 94-282 that the head of the Office of Science and Technology Policy shall be the chairman of the Federal Coordinating Committee for Science, Engineering, and Technology, Executive Order 10807 provided only that the chairman was to be designated by the President from among the members of the Council.

There is some evidence that Dr. Hornig's predecessor, Dr. Wiesner, considered that he chaired the Federal Council as Director of the Office of Science and Technology. Annual reports of the Federal Council through 1964 listed the Chairman under his position as Director of the Office of Science and Technology, and carried a footnote reference to the fact that the Director also held the position of Special Assistant to the President for Science and Technology.

From 1965 onward, Federal Council annual reports listed the Chairman under his position as Special Assistant to the President for Science and Technology, and carried a footnote that the Special Assistant also served as Director, Office of Science and Technology. Under the latter procedure, since the Special Assistant was a part of the White House staff, the Federal Council was identified as a Presidential advisory body, and thereby in a privileged position. Only such information about its activities as the President desired to be made public was available. While Congress could call on the Director, Office of Science and Technology to testify, so long as the Federal Council was a part of the Executive Office of the President, it could not call on him as Special Assistant to the President for Science and Technology to appear in his capacity as Chairman of the Federal Council.¹⁷ During the time OST was in existence, the need did not arise because in appearances before congressional committees, the Director of OST frequently answered questions about the Federal Council, and he commonly used activities of the Federal Council committees as illustrations of OST accomplishments.

Throughout the Federal Council's history, executive secretaries of the Council appeared before Congress on at least four occasions.¹⁸

Also, as a Special Assistant to the President, the Chairman of the Federal Council was a part of the White House Office. Since he had no authority over the member departments and agencies of the Federal Council, and had to rely on a variety of subtle measures to work toward agreed courses of action, this closer visible tie to the White House was probably beneficial. Even such a perquisite as being able to use White House stationery carried prestige and implied a closer tie to the President than merely being part of the President's Executive Office.

¹⁷ The situation was somewhat altered after the abolition of the Office of Science and Technology. Dr. H. Guyford Stever's appearance on June 10, 1975, before the Subcommittee on Domestic and International Scientific Planning and Analysis of the House Committee on Science and Technology is believed to be the first time that a science adviser to the President has testified in his capacity as Chairman of the Federal Council.

¹⁸ Dr. Edward Wenk, Jr., on November 19, 1963 before the House Select Committee on Government Research, op. cit.; Dr. Charles V. Kidd, on Mar. 6, 1967, before the Subcommittee on Immigration and Naturalization, Senate Judiciary Committee, and on Jan. 23, 1968, before the Subcommittee on Research and Technical Programs, House Government Operations Committee, on both occasions on the "brain drain"; and Dr. John V. Granger on June 3, 1975, before the Subcommittee on Domestic and International Scientific Planning and Analysis of the House Committee on Science and Technology, on the annual report on the Federal R and D program for fiscal year 1976.

PRESIDENTIAL STATEMENTS CONCERNING FEDERAL COUNCIL ACTIVITIES
(1963-1968)

One measure of Presidential interest in the Federal Council is the degree to which the President associated himself with its recommendations, and assigned it new or continuing duties. The Public Papers of President Lyndon Johnson contain ten documents which refer to the Federal Council for Science and Technology. Seven of these were Presidential statements endorsing and transmitting to the Congress reports by Federal Council committees concerning the status of interagency oceanographic, water resources, and atmospheric programs, and on noise. One statement referred to the Federal Council role in a report from the National Science Foundation (weather modification). There was also a Presidential statement accompanying the Executive order enlarging the Federal Council in 1967. The last statement (strengthening academic capability for science) contained a Presidential task assignment to the Council. The statements are excerpted below. See Appendix J for complete texts.

March 19, 1964—Oceanographic research: Letter to the President of the Senate and to the Speaker of the House transmitting reports on oceanographic research [* * * "I am pleased to forward advance copies of two publications of the Federal Council * * * that set forth Government-wide plans and budget details. * * *. The proposed Federal budget in oceanography is \$138 million * * * 11% more than Fiscal Year 1964 * * * This proposed growth is an absolute minimum * * * to achieve those objectives in oceanic research * * * previously enunciated by both President Kennedy and the Congress * * *. I * * * should like to call attention to the Government-wide character of this program. * * * Special measures are * * * being continued by the Office of Science and Technology and the Federal Council * * *, with the assistance of the ICO, to achieve effective interagency planning and coordination."]

March 20, 1964—Water resources research program: Letter to the President of the Senate and to the Speaker of the House transmitting report on the water resources program [* * * This report of the Federal Council for Science and Technology sets forth agency plans and interagency coordination of water research programs contained in the budget. * * * I share the concerns of Congress regarding the growing water problems and, therefore, commend this report for your consideration in connection with the budget request and the need for new legislation to stimulate research in the field of water resources at the colleges and universities. The Office of Science and Technology and the Federal Council * * * will continue to give this area the attention required to achieve and maintain effective interagency planning and coordination and an adequate effort in water resources research."]

March 2, 1965—National oceanographic program: Letter to the President of the Senate and to the Speaker of the House transmitting the national oceanographic program.

["I am very happy to transmit to the Congress my oceanographic program for fiscal year 1966. * * * the Federal budget of \$141 million in oceanography * * * is an absolute minimum if our nation is to use its capabilities well and to progress toward its objectives in oceanography. * * * I especially invite your attention to the manner in which the individual Federal agencies' programs have been blended toward the attainment of common goals. I consider this coordination, achieved under the guidance of the Federal Council * * * to be essential if we are to exploit the seas in an effective manner." * * *]

May 24, 1965—Weather modification: Message to the Congress transmitting sixth annual report on weather modification [by the Director of the National Science Foundation] [* * * "Over the past year, there have been positive actions which are reviewed in this report. These actions include the following: * * *. 4. Strengthened cooperation among Federal Agencies through the Federal Council for Science and Technology." * * *].

May 25, 1965—Water resources research program: Letter to the President of the Senate and to the Speaker of the House on the Federal water resources research program. [* * * "I am pleased to transmit a report summarizing the Federal Water Resources Research Program for Fiscal Year 1966 prepared by the Committee on Water Resources Research of the Federal Council * * *. The program is not large but it is vital. * * * I am asking the Chairman of the Federal Council to press forward on the development of this plan." * * *].

September 14, 1965—Strengthening academic capability for science: Statement by the President to the Cabinet and Memorandum on Strengthening Academic Capability for Science [* * * "The purpose of the new policy statement I am issuing today is to insure that our programs for Federal support of research in colleges and universities contribute more to the long-run strengthening of the universities and colleges so that these institutions can best serve the Nation in the years ahead * * *. By adopting this policy, I am asking each agency and department with major research responsibilities to reexamine its practices in the financing of research. I want to be sure that, consistent with agency missions and objectives, all practical measures are taken to strengthen the institutions where research now goes on, and to help additional institutions to become more effective centers for teaching and research."]

Memorandum for Heads of Departments and Agencies: ["* * * My Special Assistant for Science and Technology * * * with the help of the Federal Council for Science and Technology, will follow the response of the departments and agencies to this policy. I have asked him to obtain monthly progress reports and submit them to me."]

March 19, 1966—Ten-year Federal water resources research program: Letter to the President of the Senate and to

the Speaker of the House transmitting report "A Ten-Year Program of Federal Water Resources Research." ["Last year, through my Special Assistant for Science and Technology, I asked the Committee on Water Resources Research of the Federal Council for Science and Technology to speed the development of a comprehensive, long-range water research program. That task has now been completed. * * * The ten-year research program out-lined in the report * * * establishes a guideline for action. * * * It has been used as a basis for preparing our Fiscal Year 1967 Budget requests. I recommend that the various committees of Congress concerned with our water resources carefully consider what this report has to say."]

May 13, 1966—National atmospheric sciences program: Letter to the President of the Senate and to the Speaker of the House transmitting a summary of the national atmospheric sciences program, fiscal year 1967 ["I have the honor to transmit * * * a summary of the Federal Government's 'National Atmospheric Sciences Program' for Fiscal Year 1967, prepared by the Federal Council * * * The summary covers the coordinated activities of 10 Federal agencies engaged in 25 important lines of science research and service. * * * I urge the committees of Congress interested in the atmospheric sciences program to consider the attached summary report."]

November 8, 1967—Enlarging the Federal Council for Science and Technology: Statement by the President upon signing order enlarging the Federal Council for Science and Technology ["I need the coordinated advice and help of every Federal agency with major responsibilities in science and technology. The addition of State, HUD, and DOT members to the Federal Council for Science and Technology will make the Council more effective."]

November 4, 1968—Noise: Statement by the President upon releasing a report on noise in the environment. ["President Johnson today challenged industry, universities, and public authorities to make a concerted attack on the problem of noise in our environment. He also directed the Federal departments and agencies to undertake or expand programs to reduce the problems created by the rising tide of noise. * * * The President released a report entitled "Noise—Sound Without Value," prepared under the direction of the Federal Council for Science and Technology. * * * The report reviews existing Federal programs involving research, education, and the setting and enforcement of standards and guidelines, and considers the further steps which need to be taken. The President endorsed the recommended allocation of responsibilities among Federal agencies, and directed that steps be taken to improve coordination among them and between the Federal Government, the private sector, and State and municipal authorities."] [Weekly compilation of Presidential documents, v. 4, Nov. 11, 1968: 1575-1576]

There is really no way to evaluate what ten Presidential references to the Federal Council in five years signifies, other than to compar

this number with the two references to the Council in the Public Papers of President Nixon in over four and a half years in office, and the absence of any references in Weekly Compilation of Presidential Documents since President Ford has been in office.

SUMMARY OF FEDERAL COUNCIL OPERATIONS, 1963-1968

Attention is directed to the summary of functions and operations of the Federal Council (Dr. Wenk's statement) which is included in the previous section of this report dealing with the Kennedy Administration. Much of the general information therein pertained also to the Council in later years. Additional information about Council operations is summarized below:

Membership

Departments and agencies were generally represented on the Federal Council, at least formally, on a fairly high level, with 3 agency heads, 4 assistant secretaries, and others such as the Director of Defense Research and Engineering, and the Science Adviser to the Secretary (Interior). A review of the terms of service on the Federal Council showed a fairly stable group, with a majority of the departments and agencies having the same representative or not more than two different representatives during the five-year period. (See Appendix G.) The extent to which designated members actually attended Federal Council meetings during the period under discussion is not known.

Membership enlarged by amendment to Executive Order 10807

In 1966 two new Cabinet departments were established—the Department of Transportation and the Department of Housing and Urban Development. The research and development responsibilities of these departments provided justification for their formal representation on the Federal Council. Also, it was decided that the Department of State should be accorded member, rather than observer, status. Since the membership of the Council was fixed in Executive Order 10807, it was necessary to amend the Executive order. This was done by Executive Order 11381 of November 8, 1967, the only amendment to Executive Order 10807 until it was abolished in 1976 by Public Law 94-282.

Staff

Staff for the Federal Council was provided by OST. This included the Chairman (compensated as Director, OST), the Executive Secretary (a technical assistant, also responsible for program planning and coordination, on the OST staff), the services of other OST staff who assisted on Federal Council committees, and logistical support, including secretarial services. A 1966 estimate of the annual cost to OST of staff support for the Federal Council was less than \$100,000.¹⁹

The principal cost of the Federal Council is not the staffing of the Council per se but the salaries of persons who are members of the Council or of its committees and panels. Since this service is so closely related to the regular jobs of these people, an estimate of the

¹⁹ U.S. Executive Office of the President. Office of Science and Technology. Activities of the Federal Council for Science and Technology; Report for 1965 and 1966. p. 10.

total actual annual cost of the Federal Council was considered not possible during this period.²⁰

Executive Secretary

Following Dr. Edward Wenk's departure from OST in the autumn of 1964, Dr. Charles V. Kidd assumed the duties of Executive Secretary of the Council and he remained in this position until he retired from Government service in July 1969.

OST staff on committees

During this period, some of the Federal Council committees were chaired by OST staff, in particular, the Committee on Scientific and Technical Information, the Committee on Water Resources Research, and the Committee on Environmental Quality. Other OST staff served as observers on other interdepartmental committees of the Council. In some cases, the same OST staff member served as an observer on as many as five different committees.

A Senate Appropriations subcommittee questioned Dr. Hornig in 1965 about the practice of using OST staff to chair Federal Council committees. Senator Warren Magnuson asked him whether this policy might not "concentrate in OST full powers in advising the President on science and technological policy and research." Dr. Hornig's response was as follows:²¹

No. The Federal Council for Science and Technology is an advisory group and committees of the Council are advisory to the Council. The judgments expressed by committees therefore constitute staff advice for the Federal Council, which takes committee recommendations into account when it renders advice. The FCST can comment upon, accept or reject the advice of FCST committees. In addition, any head of an agency which reports directly to the President has the option of advising the President directly. For these reasons, the fact that an OST staff member serves as chairman of an FCST committee would not concentrate in OST full powers in advising the President on matters of science and technology.

Recent (1976) listings of Federal Council committees indicate that staff of the Science and Technology Policy Office in NSF (now within the Division of Policy Research and Analysis) have continued this practice of serving on Federal Council committees, both in a member and observer status.

Federal Council meetings

During the period under discussion, the number of Federal Council meetings per year was reduced. Frequency of meetings is shown below:

<i>Number of FCST meetings, calendar years 1964-68</i>		
Year:		<i>Meeting</i>
1963	-----	12
1964	-----	14
1965	-----	11
1966	-----	9
1967	-----	8
1968	-----	8

²⁰ Ibid.

²¹ U.S. Congress. Senate. Committee on Appropriations. Independent Offices Appropriations, 1966. Hearings . . . 89th Congress 1st session. p. 1356.

The meetings were closed. Minutes were prepared for internal use.

Annual reports

Annual reports on activities of the Federal Council were published by the Office of Science and Technology as follows:

The role of the Federal Council for Science and Technology;
Report for 1963 and 1964. 53 p.

Activities of the Federal Council for Science and Technology;
Report for 1965 and 1966. 47 p.

Federal Council for Science and Technology; 1967 annual
report. 43 p.

Federal Council for Science and Technology; 1968 annual
report. 32 p.

Each of the reports contained varying amounts of information about matters which the Council had considered during the period covered, together with individual reviews of the activities of the various committees, lists of published reports, and Council and committees' membership lists. Despite the tendency of the reports to become shorter year by year, when compared to the period before 1962 and the period since 1969 when no reports were issued, the reports during the 1960's contain a wealth of material. For example, in the spring of 1976, the Federal Council did not have a composite listing of reports published under its aegis or even of reports published since those listed in the 1969 annual report.

Federal Council Committees

The number of Federal Council committees gradually increased during the Johnson Administration. Each year saw the establishment of one or more committees or working groups. Simultaneously, almost every year one or more committees was abolished or merged into another committee. A year by year total for this period showed 52 committees and 1 panel in existence at the end of 1964 and again in 1965; in 1966, there were 12 committees and 1 panel and a newly created working group. In 1967 to the 11 existing committees, and 1 panel, 2 new committees were added, making a total of 14. In 1968, the count was 13 already existing committees, 1 panel, and 1 new committee, totaling 15.

Table 4 is an extension of an earlier, similar chart showing the evolution of Federal Council committees, panels, and working groups for the 1959-1968 period. It is as accurate as can be assembled from the public record and from records in the former Federal Council for Science and Technology.

Annual reports of the Federal Council for this period review activities of the various committees and the reader is referred to them for additional details relating to a particular committee. Many of the topics considered by the Federal Council, as also set forth in the annual reports, relate to activities which originated within the inter-agency committees.

PROBLEMS CONSIDERED BY THE FEDERAL COUNCIL, 1964-1968

Some indication of the kinds of matters considered by the Federal Council during this period may be obtained from reading through the listings in the annual reports. Time and space permit only extended discussion on a selective basis of some of the matters considered.

TABLE 4

FEDERAL COUNCIL COMMITTEES AND PANELS, GROUPS, ETC.	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968
1959- 1968										
Standing Committee (From 1967-- Committee on Federal Laboratories)	E	*****	*****	*****	*****	*****	*****	*****	*****	C
Technical Committee on High Energy Physics	E	****	*****	*****	*****	*****	*****	*****	*****	C
International Committee	E	*****	*****	*****	*****	*****	*****	*****	*****	C
Coordinating Committee on Materials Research & Development	E	*****	*****	*****	*****	*****	*****	*****	*****	C
Interdepartmental Committee for Atmospheric Sciences	E	*****	*****	*****	*****	*****	*****	*****	*****	C
Interagency Committee on Oceanography	E	*****	*****	*****	*****	*****	*****	*****	*****	A
Committee on Long-Range Planning			E *****	*****	*****	*****	*****	*****	*****	C
Committee on Natural Resources			E *****	*****	*****	*****	*****	*****	*****	A
Subcommittee on Water Resources Research			E M 1/							
Committee on Water Resources Research				E ****	*****	*****	*****	*****	*****	C
Committee on Scientific Information				E *****	M 2/					
Committee on Scientific Personnel				E *****	*****	A 3/				
Ad Hoc Panel on Transportation Research					E *AA/					
Patent Advisory Panel					E *****	*****	*****	*****	*****	C
Committee on Behavioral Sciences					E *****	*****	*****	*****	*****	C
Committee on Scientific and Technical Information						E *****	*****	*****	*****	C
Committee on Government Patent Policy							E *****	*****	*****	C
Committee on Academic Science and Engineering							E *****	*****	*****	C
Ad Hoc Working Group on Solid Earth Sciences								E M5/		
Committee on Solid Earth Sciences									E*	C
Committee on Environmental Quality									E	C
Ad Hoc Interagency Working Group for Earthquake Research										M ⁶ /
Interagency Upper Mantle Committee										M ⁶ /
Interagency Arctic Research Coordinating Committee										E

Legend: E = Established
C = Continuing
M = Merged
A = Abolished
T = Transferred

- 1/ Merged into a new Committee on Water Resources Research
2/ Merged into a broadened new Committee on Scientific and Technical Information
3/ Functions taken over by Standing Committee
4/ Abolished when Department of Commerce assumed direct responsibility for this field
5/ Merged into Committee on Solid Earth Sciences
6/ Became subordinate groups of Committee on Solid Earth Sciences

*1964 activities*²²

- Long-range planning; (see below)
- Improvement of communication between policy level officials and career scientists, engineers, and administrators of technical programs through symposia;
- Establishing priorities and identifying job features needing improvement or further study;
- Determination of impact of new grade ceilings on the Government's research and development agencies;
- Management and handling of scientific and technical information;
- Patent rights from federally financed research and development;
- U.S. Government participation in and support of international scientific activities.

Long-range planning

The long-range planning activities of the Federal Council in the 1961-1964 period have been selected for further discussion because this activity was what was termed a "pioneer" effort. The Council's experience and the lessons learned from this early effort may be relevant to current assignments to the new Federal Coordinating Council and the Office of Science and Technology Policy.

Long-range planning for research and development has been defined as "the process of identifying the major alternative strategic paths that programs might follow, weighing the technical knowledge and resource commitments required if each alternative path were followed, assessing the full consequences of following each path, assessing the major contingencies that might arise if each path were followed, and making sets of decisions in the light of all of these considerations."²³

Executive Order 10807 directed the Federal Council to consider, among other factors, "long-range program plans designed to meet the scientific and technological needs of the Federal Government, including manpower and capital requirements," when recommending policies and other measures to address problems affecting more than one agency or the national advancement of science and technology, including that of providing "more effective planning and administration of Federal scientific and technological programs."

In September 1961 the Federal Council established a Committee on Long-Range Planning to focus on this aspect of its responsibility. The Committee was headed by Dr. Harvey Brooks of Harvard University. This was the only instance of a non-Government person chairing a Federal Council committee.²⁴ It is understood that an outsider was chosen because of a belief that the departments and agencies would be more willing to divulge their future plans to him than to a chairman from another Federal agency, with whom they might find themselves in competition for future resources. Dr. Charles V. Kidd, the Council's Executive Secretary, served as Executive Secretary to the Committee, during part of its existence.

Activities of the Long-Range Planning Committee were reported during the 1961-1964 period in annual reports of the Federal Council²⁵

²² The Role of the Federal Council for Science and Technology; Report for 1963 and 1964, pp. 39-48.

²³ Ibid., p. 19.

²⁴ The following departments and agencies were members of the Committee: State, Defense, Interior, Agriculture, Commerce, HEW, AEC, FAA, NASA, and NSF, with an observer from BOB.

²⁵ 1962 Annual Report and Report for 1963 and 1964, op. cit., pp. 13-14, 18-22, respectively.

but not subsequently. However, as late as October 1967, the Committee, still under Dr. Brooks, was included in an unpublished listing of Federal Council committees. It did not appear in a December 1967 listing. The Federal Council's annual report for 1969 stated that the Committee on Long Range Planning was one of several committees which were discontinued in June 1969, following a review of all Federal Council committees.

A principal effort of the Long-Range Planning Committee, working with the Science Resources Planning Office of the National Science Foundation, was a survey in 1962 of research and development plans and requirements of the Federal agencies through 1970. An elaborate questionnaire²⁶ was sent to each agency requesting data on its expected expenditures through 1970 and on the implications of these expenditures in terms of additional scientific manpower needs. The questionnaires were followed by interviews with policymaking officials of the agencies "to secure their judgments on the basic factors affecting the future of the research and development activities for which they were responsible and some qualitative information on their relative dependence on or efforts in various scientific fields."²⁷

The results of the survey and interviews were never published because of the numerous problems.

The concept of long-range planning was new to some of the agencies. Agencies varied in their own planning activities. Some had a more favorable attitude toward long-range planning than others. This meant that the responses varied from agency to agency.

The survey placed primary importance on use of resources—money and manpower—in long-range planning. Other elements of potential significance such as identification of goals, and alternatives for program development were not given sufficient attention.

Another aspect of the difficulty was the lack of staff resources either in the Office of Science and Technology or the National Science Foundation to provide the necessary direction of the study in order to focus on policy issues. In sum, the results from the different agencies were so disparate that it was not possible to make a meaningful overall picture of the situation.²⁸

The discussion of long-range planning in the Council's annual report for 1963 and 1964²⁹ is interesting and relevant because of the generalizations pointed up regarding the long-range planning process for research and development. The discussion presented the justification for looking ahead when making current decisions: Facilities and scientific manpower both take years to create; once created, both have a long life which must be used effectively.

The "heart" of long-range planning within agencies is "continuing exploration of alternatives and the establishment of major policy

²⁶ Described anonymously as a "nightmare."

²⁷ Report for 1963 and 1964. *Ibid.*, p. 20.

²⁸ On July 31, 1962, when discussing the Federal Council activities, Dr. Wiesner alluded to its long-range planning effort. He said, "One of the hardest things we tried to do, and it may turn out in the end to be impossible, is to make longer term projections because of the feedback nature of science. It is almost impossible for one to predict in a really definitive way what programs are going to look like 5 years from now."

"You can be pretty sure of next year and in some fields you can talk about 3 or 4 years. When you go to 10 years you are mainly talking through your hat as you can well imagine. If you consider the things that we regard as being important today, you realize that many of them are things we didn't visualize a decade ago. So I think one has to regard long-range planning as a useful exercise in management, but not put too much faith in the direction, particularly long-term direction, that you will get out of it." U.S. Congress, House, Committee on Government Operations, Subcommittee on Military Operations, Systems Development and Management. Hearings 87th Cong. 2d sess. Washington, U.S. Govt. Print. Off., 1962, Part 1, pp. 151-152.

²⁹ Report for 1963 and 1964, *op. cit.*, pp. 18-22.

goals" by responsible agency officials. Decisions based upon these factors can then be made in terms of funds and manpower needed to implement them. As noted above, the Council's planning effort started with funds and manpower.

Long-range planning also involves evaluation of the impact of each agency's plans on those of the other agencies and on the national need. The final effort must take into account both general policy considerations emanating from the agencies and general Administration policies as well.

Certain lessons were made clear from the Council's long-range planning effort. Among them were:³⁰

The degree of detail in which goals, and therefore data, can be usefully stated decreases rapidly as the span of forecast increases. The farther into the future the forecast is made, the greater the number and extent of uncertainties, and hence the futility of forecasting details.

Long-range planning * * * is a most complex process. Realistic planning must proceed simultaneously in a number of independent spheres, many of which are not scientific or technological.

The fact that planning must proceed simultaneously in a number of largely autonomous spheres has important implications for the planning process. First, there can under such a concept be no such thing as "the plan," just as there is no simple, single, national science policy. There are many plans, each representing a valid way of looking at science and technology. This characteristic of the planning process is consistent with our pluralistic approach to the definition and resolution of important public matters. * * * Second, the distinction between ends and means tends to become blurred when planning proceeds simultaneously in different but related areas. For example, basic research can be validly assessed either as an end in itself or as a long-range means of attaining social goals. * * * Third, the process of planning occurs at different levels—ranging from the individual investigator to the national scene. It is important that the entire process operates so that the right kinds of decisions are reserved for each level. Fourth, the entire process of planning is so intricate that it is not possible or desirable to undertake to integrate all of the different kinds of planning. The interaction of different kinds of planning are not fully predictable. For this reason, the system must be flexible and open, so that corrective action can be taken when the unanticipated occurs. The feed-back process, fully predictable. For this reason, the system must be flexible and open, so that corrective action can be taken when the unanticipated occurs. The feed-back process, resulting in the correction of errors, is the substitute for omniscience.

³⁰ Ibid., pp. 21-22.

More than a decade later, long-range planning is still in the exploratory stages.³¹ Opinions about it range from solid supporters to those who regard long-range plans as "not worth the paper they are printed on." One major difficulty in long-range planning is that stability assurance is a necessity, but also an impossibility, given the current appropriation process which operates on a year to year basis.

1965 and 1966 activities

The following summary has been extracted from the Federal Council's annual report for 1965 and 1966:³²

A. Problems considered by the Council

The formal charter of the Federal Council is broad (* * *), but its primary functions can be briefly stated in key phrases from the charter (Executive Order 10807, Mar. 13, 1959). These phrases are quoted below, and beneath each of them are listed pertinent selected items discussed by the Council in 1965 and 1966:

1. "Provide more effective planning and administration of Federal scientific and technological programs."

(a) Development of an FCST Policy Statement on Interagency Transfer of Funds for R. & D.;

(b) Proposal for a Government-Wide Research Project Reporting System;

(c) Problems Involved in Establishing National Information Systems;

(d) Consideration of the Proposal of the Interagency Committee on Atmospheric Sciences for Research on Weather Modification;

(e) Development of a Coherent Plan for Water Resources Research.

2. "Identify research needs including areas of research requiring additional emphasis."

(a) Progress Report on Study of Federal Research in the Solid Earth Sciences;

(b) Reaction of the Federal Council to the National Academy of Sciences reports: *Chemistry: Opportunities and Needs*; *Ground Based Astronomy*; and *Physics, Survey and Outlook*.

(c) Reaction of the Federal Council to the PSAC reports: *Effective Use of the Sea and Restoring the Quality of Our Environment*.

(d) Implications for Federal Agencies of Science Policy Discussions by PSAC;

(e) Proposed Establishment of FCST Committees on Environmental Quality, Computer Sciences, and Earthquake Prediction.

³¹ See for example, "Long Range Planning," a committee print, prepared for the Subcommittee on the Environment and the Atmosphere of the House Committee on Science and Technology by the Congressional Research Service, May 1976, to provide background information for hearings on legislation to improve long-term Federal policy planning. (Washington, U.S. Govt. Print. Off., 1976, 487 p.)

³² Activities of the Federal Council for Science and Technology; Report for 1965 and 1966. pp. 1-3, 5-7. Section B, pp. 3-5, not included.

3. "Achieve more effective utilization of the scientific and technological resources and facilities of Federal agencies, including the elimination of unnecessary duplication."

(a) Progress Report on Development of an Inter-agency Compatible Statistical Reporting System for Support of Academic Research, and for Research Projects;

(b) Effects of Controls over Positions and Average Salaries on the Efficiency of Federal Laboratories;

(c) Preparation of a Policy on Strengthening Academic Capability for Science Throughout the Country;

(d) Use of Federal Laboratories for University Research and Training of Graduate Students;

(e) Consideration of the Annual Council Report on the Effectiveness of the President's Patent Policy;

(f) Review of the Report of the Standing Committee, *The Environment for Quality*. (Government personnel.)

(g) Development of an FCST Policy Statement on Possible Conflicts of Interest of Faculty Members Receiving Federal Research Support.

4. "Further international cooperation in science and technology."

(a) Coordination of the International Biological Program by the National Science Foundation;

(b) Forthcoming Visits of an OECD Team to Evaluate American Science and Technology;

(c) The Attitude of Various Nations Toward Cooperation with the United States in Science;

(d) Growing Concern over the Significance of the Technological Gap (pp. 1-2).

A function of the Council which was not foreseen explicitly in the Executive Order which created it, but which has evolved from experience, is provision of information by the Chairman of FCST to the members on developments in the Executive Office of the President and on the attitudes of the President toward matters of interest to the Council. This function has been one byproduct of the fact that the President has designated his Special Assistant for Science and Technology as Chairman of the Council since it was formed. All in all, the Chairman reported on about 50 items to the Council. They included such subjects as limitations on employment of scientists at high levels ("GS-14 and above"), relations between program budgeting and research operations, the general outlook for the President's budget for fiscal years 1967 and 1968, and the implications of new policies on cost participation in Federal grants by colleges and universities.

The existence of a channel for a continuing flow of information from the President's office to agencies is important, just as is the flow of information from the agencies. Effective operation and coordination are characterized not as much by large, dramatic changes as by evolution in small steps, and for this, free communication is vital.

The nature of Council action can be illustrated by indicating how some of its agenda items were disposed of:

What was the effect of administrative limitations on the employment of scientists at high civil service levels on the efficiency of Federal laboratories?

Operating officials found that the limitations threatened to have seriously adverse effects. In response to the reaction of the Council as well as to other forces, rules were clarified, and a number of agencies modified their internal guidelines, so that the anticipated difficulties were largely avoided.

How can Federal agencies assure themselves that recipients of Federal research funds in universities are not simultaneously engaged in outside activities which generate conflicts of interest?

The American Council on Education and the American Association of University Professors were asked to prepare a joint statement of ethics and basic procedures acceptable to faculty members which would adequately guard against conflicts of interest. Universities were asked to report the adoption of such policies to the American Council on Education. All of the Federal agencies agreed, through the Federal Council for Science and Technology, to accept university policies certified as satisfactory by the Office of Science and Technology.

What is the current state of weather modification research in the Federal Government; what should be the response to studies on this subject by the National Science Foundation and the National Academy of Sciences?

The Council's Interdepartmental Committee for Atmospheric Sciences compiled a report stating a series of activities and budgetary levels to carry them out. The total expenditures anticipated for 1970 were \$147 million. This was not considered satisfactory because such factors as competing demands for skilled manpower had not been taken adequately into account. Different agencies were expecting to use the same limited pool of trained manpower. Dr. Homer Newell of NASA was asked to convene a group to prepare a program for 5 years in the future. This group recommended a 1970 expenditure level of \$87 million, with carefully selected priorities. The recommendations of the report, "A Recommended National Program in Weather Modification", were accepted by ICAS and the Federal Council. (pp. 2-3)

How should a new law (Public Law 89-487, 89th Cong.) on disclosure of information be interpreted to make the results of Federally supported research public at appropriate times and in appropriate detail?

Representatives of the Department of Justice explained the terms of the law and the current state of interpretation of the Federal Council, and the member agencies requested that the Department provide further

clarification of the interpretation of the statute. It was agreed that the general presumption of public disclosure is sound. It appeared that the agencies would not have to release information at a time which they would consider premature—that is, before scientists have completed their research, or information provided in confidence in applications for research grants and contracts. The members of the Council worked with the Department of Justice in preparing a uniform interpretive guide for the law.

How can Federal laboratories be used more effectively for advanced training and research?

Dr. Alvin Weinberg, Director of the Oak Ridge National Laboratory, and Dr. James Shannon, the Director of the National Institutes of Health, discussed experience with the use of their laboratories for academic and advanced training. The Standing Committee was then asked to survey opportunities and problems in this area for the Council, and its views will be presented in 1967 (p. 3).

* * * * *

C. *Strengthening academic science—A case study in policy development*

The way in which the Council participates in the development of policy can be illustrated by reference to the effects of Federal research and development funds on academic institutions. Individual Federal agencies have statutory authority to support research and development for purposes specified by Congress. Accordingly, each agency provides funds to scientists in colleges and universities for research of importance to its assigned responsibilities. But the combined effects of these several programs may bring to light unanticipated opportunities for constructive action or may generate unanticipated problems. For example, there is an opportunity to use Federal funds deliberately to strengthen individual universities totally to offset the high concentration of funds in relatively few institutions as a consequence of many independent actions by the agencies.

The long-range implications of Federal support of science for universities had been of interest to the Presidential science advisers for a long time. For example, the 1960 report of the President's Science Advisory Committee, *Scientific Progress, the Universities and the Federal Government*, stated that, "The truth is as simple as it is important: *Whether the quantity and quality of basic research and graduate education in the United States will be adequate or inadequate depends primarily upon the government of the United States. From this responsibility the Federal Government has no escape. Either it will find the policies—and the resources—which permit our universities to flourish and their duties to be adequately discharged—or no one will.*" [italics in the original.]

Since the combined actions of all agencies generate problems and offer potential opportunities, the Federal Council has also been concerned with these questions. The National Science Foundation presented a paper on them at the May 1965 meeting of the Council. After discussion, the Executive Secretary was asked to draft a policy statement for further discussion. This was done and in the following month the Council approved a draft *Policy Statement on Strengthening Academic Capability for Science Throughout the Country*, which was refined in later discussions with the agencies.

Since important questions of policy were involved, the draft statement was sent to the President in September. It was considered to be of such significance that the essential ideas were the basis for a memorandum sent by the President to the heads of departments and agencies, and for a public statement by the President * * *.

The Council then established a Committee on Academic Science and Engineering to work on the implementation of the policy and other matters involving the Federal Government and universities (p. 5).

The first tangible result of the work of this group was to secure data on Federal funds provided to individual institutions of higher education by each Federal agency. Some of the most useful information was published in *Federal Support for Academic Science and Other Educational Activities in Universities and Colleges, Fiscal Year 1965*. A computer tape containing all of the data secured in the survey was made available to the Science Policy Research Division of the Library of Congress to insure that the information would be easily and quickly available to the legislators. More detailed information on Federal funds provided to each institution will be secured in future surveys.

The President's policy also stimulated the adoption by the Department of Defense of a new program (Project THEMIS) with \$20 million in new funds, designed to tap the talents found in smaller or less developed colleges and universities.

A further consequence of the policy in the first full Federal budgetary cycle after its adoption has been increased emphasis on agency programs which stress the development of institutions rather than the support of individual research projects.

The policy has also been responsible for intensive work on the development of simplified application forms which will reduce to a minimum the number of questions which educational institutions will have to answer in seeking Federal grants for construction. Further measures designed to simplify the process of applying for funds are under study.

Finally, the policy has helped to establish a point of view and attitude among Federal officials.

This case is instructive in a number of respects:

1. The issuance of a Presidential policy was preceded by a long chain of interrelated discussions.

2. The issuance of a policy did not in itself provide a complete solution. It set a general course of action and influenced many subsequent events, some directly and some indirectly.

3. In the development of science policy, PSAC, OST staff, the Federal Council, the National Science Foundation and other agencies all play a role. There is no central point at which all policy is determined.

4. Science policy and planning are approached pragmatically and in terms of broad areas, rather than in terms of a single, all-encompassing plan.

D. Science and Technology in Other Countries

The Council has provided a useful forum for discussion of science and technology in other countries in relation to questions of significance to the United States. The most extensive session of this sort was on January 24, 1966, when the Lord Snow (Parliamentary Secretary, Ministry of Technology, England) discussed the general status of science and technology in England with the Council.

The nature of the discussion can be judged from this sample of the kinds of questions that were raised:

Why has England elected to set up separate ministries for science and for technology?

What will be the status of specialized laboratories that are not now under the ministries?

What are the effects on industrial research and development of relatively heavy concentration of effort in government laboratories in England?

What are the effects of U.S. investment in Europe on the technological capacity of European countries?

What is the role of joint governmental-industrial associations?

The discussion preceded later public discussions of the technological gap and formed part of the background for response by the agencies for later requests by the President for staff work on the technological gap (pp. 6-7).

*1967 activities:*³⁴

During 1967, the Council met eight times and considered a wide variety of topics including:

1. Relations between the Federal Government and Universities:

Policies for institutional development.

Simplification of administrative procedures.

Conflict of interest policies.

Use of Federal laboratories by academic institutions.

Federal budgets for academic research.

2. Information Handling:

Policies for dissemination of information outside the United States.

Coordinated handling of matters related to EDUCOM.

³⁴ Federal Council for Science and Technology; 1967 Annual Report, pp. 2-3.

Steps towards a compatible Federal research project reporting system.

Increasing the precision of data on Federal funds for science and on support of students and faculty.

3. Patent and Copyright Policy:

Copyright policy and legislation in connection with storage and dissemination of information by computer.

Policy implications of new data on disposition of rights to inventions controlled by government.

4. International Affairs:

Guidelines for cooperative agreements in science and technology with other countries.

Improved data on U.S. grants and contracts for research and development in foreign countries.

5. Scientific and Technological Priorities:

Division of effort between basic and applied research relating to earthquakes.

Priority areas in weather modification.

Classification of areas of research on quality of the environment.

In addition to such specific topics, the Council considered more general questions—such as issues in science policy, the functions of the Council itself and means of developing the scientific and technological capacity of educational institutions. These general issues comprise Part I of this report.

Two of these general questions, namely, responses to questions concerning U.S. science policy posed by the OECD at meeting of Ministers of Science in February 1968, and consideration of the functions of the Federal Council in light of a Library of Congress report, *The Office of Science and Technology* (1967) are discussed below.

OECD Review of National Science Policy in United States

The Organisation for Economic Co-operation and Development conducted an extended study of U.S. national science policy in 1967 and 1968. The investigation included visits to the United States by representatives of OECD member nations to study science policy formulation at first hand and later, participation by U.S. representatives from the executive branch including the Director, OST, and from Congress to answer questions at a meeting of the Ministers of Science in Paris in February 1968.

In preparation for this appearance, the Director, OST, in his capacity as Chairman of the Federal Council sought the views of members of the Council as representatives of their agencies for advice on responses to a series of questions which had been submitted to him in advance of the meeting. The Federal Council Annual Report for 1967 contains a summary of Council consideration of questions in six main areas.³⁵ These related to a discussion of pluralism versus a centralized approach for science and technology organization, adequacy of existing institutional mechanisms to achieve national goals, the level of R&D expenditures to G.N.P., geographical distribution, the role of Congress, and President Eisenhower's warning against unwarranted influence of the military-industrial complex.

³⁵ Ibid., pp. 5-13.

It is not possible to compare the summary of responses to these questions which were made at the confrontation meeting in Paris in February 1968³⁶ with the summary of Council consideration of these questions as reported in the 1967 annual report. However, it seems a reasonable conclusion that both the Director, OST, and the Council members benefitted from joint discussion of these basic questions relating to American science policy. It should be noted that the questions put to the American delegation extended beyond those which the Council had discussed, to include others related to science policy and academic research, science policy and industry, and the social and international impacts of United States science policy.³⁷

FCST reaction to Library of Congress report on OST

In March 1967, the House Committee on Government Operations published as a committee print a report prepared by the Science Policy Research Division of Legislative Reference Service, Library of Congress, entitled, "The Office of Science and Technology."³⁸

The report discussed the legislative origins of the Office of Science and Technology and its relationships to other elements of the White House science advisory apparatus, including the Federal Council. The report was not a comprehensive treatment of the subject. In highlighting the principal activities, it contained many discussions of Federal Council activity in the case studies presented³⁹ and also in the introductory summary and analysis chapter.

Among the points raised in the report was the Federal Council's orientation to science rather than technology, although as the name denotes, the Council was established to consider both. Some of the difficulties in coordinating technological activities were pointed up with a commentary that Congress had been critical of OST for not asserting greater initiative. Three related questions were then stated:⁴⁰

1. Should the legislative authority of OST be explicitly expanded to embrace functions now assigned to the Federal Council, especially regarding technology?

2. If so, how should this be done without violating authority of the operating agencies?

3. Should machinery of the Federal Council be made statutory as a science subcabinet of policy officials from major agencies employing science?

Also, in the concluding section of the summary of the report on the OST, certain questions were raised concerning OST's authority; several related to its coordinating role. Among them were:⁴¹

* * * One fundamental question is whether the operation of OST is hampered by inadequate statutory authority.

In particular, should its orientation that was derived exclusively from a reorganization of NSF's policy responsi-

³⁶ Organisation for Economic Co-operation and Development. *Reviews of National Science Policy*: United States. Paris, OECD, 1968. 546 p., pp. 449-482.

³⁷ *Ibid.* at pp. 449-482.

³⁸ U.S. Library of Congress. Legislative Reference Service. Science Policy Research Division. *The Office of Science and Technology. A Report Prepared by the . . . for the Military Operations Subcommittee of the Committee on Government Operations*. Washington, U.S. Govt. Print. Off., March 1967, 326 p. [At head of title: 90th Congress 1st session, House of Representatives, Committee Print]

³⁹ Among these were atmospheric sciences, pp. 72-75; behavioral sciences, pp. 76-77; high energy physics, pp. 84-85; materials research, pp. 94-96; natural resources, pp. 106-107; oceanography, pp. 110-121; information, pp. 127-129; water resources research, pp. 137-139; and long-range planning, pp. 148-150.

⁴⁰ *Ibid.*, p. 22.

⁴¹ *Ibid.*, pp. 31-32.

bilities for basic research and education now be clarified by legislation to extend the Office's responsibilities as to technology? Would this, for example, facilitate the Office's assuring a more creative content to Federal research and development associated with its transition to economic and social goals? Should the Office be given additional statutory status to reflect the interdisciplinary nature of technological considerations?

Should the policy-planning role be explicitly spelled out by legislation—especially on Government-wide or multi-agency matters? Should the OST be responsible for long-range planning and for science policy research? Should it be obliged to prepare annual reports reviewing public purposes, resources, problems, opportunities, and alternative programs for science to serve the Nation? Should it be equipped with staff and contract authority to meet such policy-planning functions?

Should the coordinating role of OST be spelled out by legislation? Should it be equipped with an interagency advisory body by, for example, providing a statutory status to the Federal Council for Science and Technology? Should its coordinating role be extended to applied as well as basic research, and to technology, wherever merited?

Should the OST be given explicit if short-term coordinating authority in those fields that require leadership or advocacy, that cross agency lines but for which no agency has conspicuous capability to serve as delegated agent?

Should these priority fields be designated by the Congress?

Should any amendments to OST legislation await a more extensive examination of the entire Federal structure for science and technology?

The report and the questions it raised served as a basis for a review of the functions of the Federal Council by its members during 1967. A summary of this review was included in the Federal Council's annual report for 1967. It is excerpted below. Many of the points made are applicable a decade later:⁴²

Functions of the Council

The Science Policy Research Division of the Legislative Reference Service of the Library of Congress prepared an interesting report, *The Office of Science and Technology*, which served as a basis for review of the functions of the Federal Council for Science and Technology by its members.

The members of the Council agreed that the structure and authority of FCST are satisfactory, and that a legislative base for FCST is not only unnecessary but undesirable because FCST is an instrument devised for the President to use as he sees fit in the administration of the laws. Problems in making FCST more effective arise from administrative sources and not from the nature of its formal authority.

The primary questions turn around what FCST is for and how it is used. A number of members expressed a preference

⁴² Federal Council for Science and Technology; 1967 Annual Report, op. cit. pp. 13-14.

for more general, more important and more thought-provoking discussion by FCST, as contrasted with managerial and administrative matters. In this connection, the members felt that FCST could have a more effective voice in determination of policy matters if it were presented with more analyses of policy for final discussion, modification and ratification. The special tasks, interests and preoccupations of the agencies made it difficult for them to generate policy, but FCST is a good group for assessing the implications of and practical problems associated with policy proposals.

There was some feeling that FCST could be used more effectively to deal with common problems and issues, as contrasted with those having to do with the division of tasks among agencies. Planning for the post-Vietnam period as a general problem faced by all agencies was cited as a case in point.

There was a consensus on the point that the central job of both FCST and PSAC—in different ways—is to help the President's Special Assistant for Science and Technology do the best possible job for the President. In this connection, PSAC is considered as providing an important link between the scientific, academic and foundation communities and the Federal agencies. The members thought that the central criterion for assessing FCST is whether the Special Assistant feels that FCST is meeting his needs.

The communication which FCST provides among the Federal agencies is considered important, as is provision of a central point of appeal by FCST committees, and a point for ratification and activation of their recommendations.

FCST is considered as particularly useful by smaller agencies and by those in which science and technology are a small part of the total mission and are thereby somewhat subordinated.

The Chairman summarized his reaction to the discussion as follows:

(a) FCST is an interagency group advisory to the President. The fact that it is advisory is not a real limitation on its utility. The fact that it is interagency means that it can in fact deal effectively only with problems which affect more than one and usually several agencies.

(b) The forum function is extremely important. Discussion of problems in FCST generally stimulates a wider range of ideas than would result from bilateral discussions between OST and individual agencies. Conversely, FCST is a useful means of conveying information and views from the President and his Executive Office to the agencies.

(c) As a product of discussions in OST and of the work of OST committees, it is possible to provide advice which is in fact a decision when a consensus can be reached. This is generally possible except when basic differences exist among the agencies.

(d) FCST has been criticized for not exercising leadership. It is difficult for an interagency group to exercise leadership. This is more of a function of OST than FCST. The Council on Marine Resources and Engineering Development, set up at a high level, is an interesting experiment in planning and action by an interagency group, and represents about as strong a test effort for this mechanism as could be devised. The problems of interagency coordination have not been solved, and the experience of the Marine Council, FCST, and the National Aeronautics and Space Council should be useful as administrative patterns evolve.

*1968 activities:*⁴³

The Council considered an array of administrative matters, budgetary issues, and general policy questions. An indication of the kinds of administrative matters considered by the Council is provided by this list:

1. Means of working within congressional limitations on financing of interagency committees.
2. Management of laboratory equipment.
3. Inventory of laboratory equipment.
4. Summer laboratory employment of disadvantaged youth.
5. Guidelines for reduction of overseas travel.
6. Guidelines for support of research outside the United States by Federal agencies.
7. Changes in data reported in the NSF publication, *Federal Funds for Research, Development and Other Scientific Activities*.
8. Establishment of a Committee on Environmental Quality.
9. Maintenance of page charges to scholarly journals.
10. Adverse consequences of technological innovation.
11. The operation of Project THEMIS in the Department of Defense.

Discussions of budgetary issues centered around fiscal year 1969 expenditure levels and the outlook for the fiscal year 1970 President's budget.

SCIENCE ADVICE IN THE LAST YEAR OF THE JOHNSON ADMINISTRATION

The last year of the Johnson Administration was punctuated by unrest. The escalating costs of the Vietnam war and its extreme unpopularity sparked student unrest and protests at colleges and universities. Increasing demands to address social needs and the civil rights movement contributed to dissatisfaction with Administration policies. The assassination of Martin Luther King set off a wave of violent racial riots in all major cities of the nation. Classified research at universities was attacked as not properly a university activity and many universities were disrupted by demonstrations. The Department of Defense was criticized for expending money for research not related to its needs. The result was a cessation in the steady

⁴³ Federal Council for Science and Technology; 1968 Annual Report, p.1

upward spending for Federal research and development activities which had characterized the period since Sputnik.

An analysis of Dr. Hornig's years as science adviser includes many accomplishments, both in the use of science in international affairs and also in addressing many domestic problems, such as research programs for housing and transportation, encouraging the expansion of production of doctors, contributing to pollution legislation, and conducting a world food study. He is also credited with urging President Johnson in 1965 to take a major stand in support of population control.⁴⁴

Dr. Hornig served in a very difficult period in the Nation's history and for science. It is speculated that "as was the case with his White House captain [Johnson], Hornig's albatross was the budget problem caused by the Vietnam War. His greatest failure, in the eyes of much of the scientific community, was his inability to protect researchers from the impact of cutbacks in domestic spending."^{44a} Dr. Hornig expressed regret over the cutbacks in the level of R & D funding but maintained that relative to other Federal programs, science was not disproportionately affected.

During Dr. Hornig's tenure as its Chairman, the Federal Council and its committees considered a cross-section of the emerging topics of common interest to the member departments and agencies. Federal Council recommendations received Presidential support. The President transmitted Federal Council reports on various subjects to the Congress, urging compliance with their recommendations. He publicly assigned responsibilities to the Federal Council to continue to work toward the realization of coordinated interagency programs in several areas. He endorsed its recommendations concerning strengthening academic capabilities for science and provided for submission of progress reports to him via the Council.

As Director of OST, Dr. Hornig had a small staff and limited resources and more than enough to do. Yet he considered Federal Council committees activities sufficiently important to assign OST staff to serve as observers on the various committees and in a few cases assigned OST responsibility for the chairmanship of committees.

A few months before he left the White House, Dr. Hornig suggested at the annual meeting of the American Chemical Society that he thought the time had come to look again at the idea of a department of science and consider what components of the Federal government might be included.⁴⁵ This represented a shift in the position he had adhered to previously when he was in opposition to the need for reorganization.

On December 29, 1968, at the annual meeting of the American Association for the Advancement of Science, Dr. Hornig addressed again the need for changes in Federal organization for science and technology. This time he spoke to the need for looking at organization for science at the Presidential level, that is, possible changes in the Office of Science and Technology, as well as centralization of certain activities.^{45a} To strengthen science at the Presidential level, he

⁴⁴ Boffey, Philip M. The Hornig years: Did LBJ Neglect His Science Adviser? *Science*, v. 163, Jan. 31, 1969: 453-458.

^{44a} *Ibid.*, p. 458.

⁴⁵ Hornig Asks Study of a Science Department. *Scientific Research*, v. 3, Sept. 30, 1968, pp. 9-10.

^{45a} Hornig, Donald F. United States Science Policy: Its Health and Future Direction. *Science*, v. 163, Feb. 7, 1969, pp. 523-528.

proposed that the Science Advisor head a three- to five-man Council of Scientific and Technical Advisors because the range of matters the Science Advisor must consider and his responsibilities were so broad that he needed help. He mentioned the Federal Council only as an internal source of expertise and experience in assisting OST in its functions of "evaluation of existing and potential programs, the coordination of agency programs, and participation in the larger discussions of priorities and emphases."

Dr. Hornig left the White House to join Eastman Kodak Company on January 1, 1969.

On January 20, 1969, a Republican Administration under Richard M. Nixon came into office. The question of science organization was still an issue but was subordinated to a much broader organizational attempt involving several major departments and agencies. Science organization per se did not become an issue until 1973.

THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY IN THE NIXON ADMINISTRATION UNTIL ITS TRANSFER FROM THE EXECUTIVE OFFICE OF THE PRESIDENT (1969-1973)

The remainder of this history of the Federal Council has been divided into two periods. The first, and the subject of this section, deals with the Federal Council as part of the Nixon Administration before the abolition of the science advisory structure from the Executive Office of the President by Reorganization Plan No. 1 of 1973 and related actions. The second period will deal with the Federal Council under the remainder of the Nixon Administration and under the Ford Administration until the signing of the National Science and Technology Policy, Organization, and Priorities Act of 1976 which established a new Federal Coordinating Council for Science, Engineering, and Technology.

SUMMARY REMARKS CONCERNING SCIENCE ADVICE AND COORDINATION IN THE NIXON ADMINISTRATION, 1969-1973

In retrospect, the more this period is considered, the more complex it appears to be. Several factors contribute to this complexity. It appears to have been President Nixon's intention to utilize his science advisory machinery. He appointed a distinguished science adviser whom he had known over a twenty-year period, and during the early months requested his assistance on a number of science-related problems. He continued the President's Science Advisory Committee, replacing members as their terms expired or as they left for other reasons. A month after taking office he approved a Federal Council policy statement on expanded use of Federal research facilities by university investigators.

Despite its auspicious beginning, Mr. Nixon's first year in office was beset with science-related events which would have been a source of difficulty for any President. Upon the recommendation of his science advisers the President nominated to be Director of the National Science Foundation, a scientist whom it was later discovered had spoken out in opposition to the Safeguard anti-ballistic missile system which the Administration supported. When the nomination was withdrawn and the reason became known, the President was strongly

criticized for injecting political considerations as a basis for selection rather than scientific qualifications, and he subsequently admitted his error in withdrawing the nomination.

On two other major matters, the President and the Administration were opposed by members of the President's Science Advisory Committee. These related to the Administration's decision to seek congressional approval for funds to deploy an anti-ballistic missile system, and to its support for the development of a United States supersonic transport plane. In both cases PSAC's opposition became known through members of PSAC panels studying each matter who made public their opposition. The question raised here was the right of advisory bodies within the President's office publicly advising against scientific and technical projects which the Administration had decided to support, based on a totality of considerations.

In still another area, the Administration met opposition. This was in the student protests in opposition to the funding and support of classified military research at colleges and universities.

The Executive Office science advisory apparatus was also affected by two other factors. One was the President's attitude toward science. His published remarks about science revealed that he did not feel comfortable with it but because he realized its importance, he at least initially tried to bridge the gap between the scientist and the politician.⁴⁶

The other major factor was the Administration's decision to investigate the need for reorganization of the major Executive branch departments and the Executive Office of the President.

It was reported that one of Dr. DuBridge's first tasks was to review the science advisory organization in the Executive Office of the President, for which he would "wear four hats", that is, as Science Adviser, Director of OST, Chairman of the President's Science Advisory Committee, and Chairman of the Federal Council for Science and Technology, in order to determine whether any or all of these responsibilities should be detached.⁴⁷ It will be recalled that his predecessor, Dr. Hornig, had left the White House believing that some changes were in order because he felt the responsibilities were exceeding the capability of a single person to oversee. His latest suggestion had been that the OST might be reconstituted into a Council of Scientific and Technical Advisers.⁴⁸ Dr. DuBridge's own initial examination of his office made him decide not to recommend immediate changes or to give up any of his multiple assignments.⁴⁹

The Federal Council did not figure in any of the above difficulties, but because it was intimately tied into the scientific advisory structure within the Executive Office, it could not help being affected by Presidential actions and attitudes.

Looking over the four and a half year period which culminated in the removal of all science advisory units from the Executive Office, one can observe various indications that the Presidential relationship to his science advisory apparatus was becoming increasingly distant.

One of these was that a decreasing amount of information was made available. For example, no annual reports of the Federal Council were

⁴⁶ See for example, Remarks at appointment of Dr. Lee A. DuBridge as science adviser, Washington Post, Dec. 4, 1968, p. A8 and Remarks on presenting the National Medal of Science awards for 1970. May 21, 1971. Public Papers of the Presidents, Richard M. Nixon, 1971, p. 649.

⁴⁷ DuBridge: 10-12% Growth for Science. *Scientific Research*, Dec. 23, 1968, pp. 11-12.

⁴⁸ Address of Dec. 29, 1968, before AAAS. *Science*, Feb. 7, 1969, op. cit., p. 528.

⁴⁹ DuBridge: No Change in Advisory Setup. *Scientific Research*, March 3, 1969, p. 13.

published after the one for 1969. Another was the report that the Office of Science and Technology under Dr. DuBridge was shut out of participation in the discussions with the Bureau of the Budget (later Office of Management and Budget) concerning priorities for research and development funding.

Testimony presented at the 1970 House Science and Astronautics Subcommittee hearings on national science policy brought out opinions that the "central scientific organization, the whole structure in the White House and Executive Office of the President has dropped" in relation to the very high position it occupied initially, and that because of diversions "—the war, the economy, the disruptions in our own society * * * the central organization of science * * * has taken a secondary role in the administration's thinking * * *." ⁵⁰

Rumbles of organizational changes recurred, like distant thunder. In mid-1972 these sounds began to be louder and more frequent.

This is the setting in which the Federal Council for Science and Technology functioned during the first years of the Nixon Administration.

PRESIDENT-SCIENCE ADVISER RELATIONSHIPS

Dr. DuBridge as Science Adviser and Chairman of the Federal Council

President-elect Richard M. Nixon announced the appointment of Dr. Lee A. DuBridge, former long-time president of California Institute of Technology, to be his Science Adviser in early December 1968. The appointment was widely hailed because of Dr. DuBridge's distinguished record as a science adviser. Dr. DuBridge's nomination was confirmed February 7, 1969. He was reported to have had a good relationship with the President and access to see him about matters relating to science. He told a House Appropriations Subcommittee on February 25, 1969:

* * * there is need for a new order of leadership at the Presidential level in putting science and technology creatively to work on the Nation's behalf. President Nixon is well aware of the possibilities. As a measure of his interest in the Science Adviser's function, he has assigned me a wide variety of specific tasks in the early weeks of this administration, including:

Establishment of a technical panel to consider the the Santa Barbara oil spill problem. . . .

A second task . . . is to evaluate the Marine Science Commission report, the Stratton report. . . .

Other items are: Participation in the assessment of the report of the Telecommunications Task Force; Evaluation of the West on particle accelerator project; Working with a Cabinet-level committee to develop recommendations on our future military and civilian space program."⁵¹

⁵⁰ Colloquy between A. Hunter Dupree and the Honorable Charles Mosher in hearings before the Subcommittee on Science, Research and Development of the House Committee on Science and Astronautics. National Science Policy; H. Con. Res. 666. Hearings before the . . . 91st Cong. 2d sess. July 7, 1970, p. 31.

⁵¹ U.S. Congress. House. Committee on Appropriations. Independent Offices and Department of Housing and Urban Development Appropriations for 1970. Hearings before a Subcommittee of the . . . 91st Congress 1st session. Part 1, pp. 739-740.

Under Dr. DuBridge, the Federal Council met regularly and considered a wide range of matters. During 1969 the Chairman and the Council reviewed the standing committees and a number of changes which are discussed below, were made. The last published annual report of the Federal Council for 1969 noted that the Chairman hoped that the Council "could become a forum for meaningful discussion of important matters affecting Federal science policy to allow him to keep the President better informed of agency views and to allow him to discuss the President's policy directly with agency policymakers."⁵²

Dr. DuBridge was instrumental in obtaining Presidential endorsement of the Federal Council policy on expanded use of Federal research facilities by university investigators dated February 21, 1969. The record does not show any other instances of Presidential-Federal Council interaction until 1971.^{52a}

In contrast to Dr. Hornig, who served President Johnson for the whole of his more than five years in office, Dr. DuBridge resigned, effective August 31, 1970, after serving less than 20 months. He cited a wish to retire because of his age (68) as his reason. In his letter of resignation, he noted that the past 19 months had been "difficult times in many ways". He referred to fiscal problems as being responsible for the failure to reverse the slowdown of the nation's scientific and technological enterprise which began in 1967 and attributed part of the problem to the failure of Congress to appropriate funds requested in fiscal year 1970 for scientific research.

Dr. David as Science Adviser and Chairman of the Federal Council

Dr. DuBridge's resignation and his replacement by Dr. Edward E. David, Jr., were announced simultaneously. Dr. David was the first science adviser to come to the White House from industry. An electrical engineer, he most recently had been executive director of communications at Bell Laboratories. At the swearing in ceremony for Dr. David on September 14, 1970, the President said that the Administration had a commitment to support basic science, not only for itself, but for its expected benefits; "This Nation needs to strengthen its support of basic science so that the practical applications which will benefit us all can be forthcoming."⁵³ It seemed clear that in the choice of Dr. David, whom he termed "a very practical man, . . . one who puts the uses of science to the uses of man" the President hoped to have a combination of a man devoted to basic science who could facilitate its application.

From what can be learned from the public record, Dr. David had at least intermittent communication with the President. Among other things, he is credited with having been responsible for the Presidential message on science and technology sent to Congress in March 1972, the first such communication. However, it appears that he and the Office of Science and Technology were primarily

⁵² U.S. Office of Science and Technology. Federal Council for Science and Technology, 1969 Annual Report, p. 1.

^{52a} U.S. President (Richard M. Nixon). Public Papers of the Presidents, 1970. Letter Accepting Resignation of Dr. Lee A. DuBridge as Science Adviser to the President and Director of the Office of Science and Technology, August 19, 1970. [Dr. DuBridge's letter in note at p. 679]

⁵³ Public Papers of the Presidents, 1970. op. cit. Remarks at the swearing in of Dr. Edward E. David, Jr. as Science Adviser to the President and Director, Office of Science and Technology, September 14, 1970, pp. 744-745.

involved with other Executive Office units. Following the July 1973 hearings before the House Committee on Science and Astronautics, Dr. David was queried concerning his interface with the Executive Office. The question and reply were as follows:

Question. Dr. Stever reported to this Committee that he has had three meetings with the President as a result of the reorganization in 1973. During your tenure as Science Adviser, what unit of the Executive Office made the most use of your capabilities?

Answer. During my tenure as Science Adviser, OST worked closely with OMB, NSC, Domestic Council, the Council of Economic Advisers, and the Council on International Economic Policy. There were many other important occasional contacts such as CEQ, OTP, and the Drug Abuse Office, but the former were our major contacts other than the President himself, listed in the approximate order of frequency and intensity of interaction.⁵⁴

In his capacity as Chairman, Dr. David took an active interest in the Federal Council. He attended all but one of the 17 meetings held between September 1970 and July 1972. Eight new interagency committees were established during this period; only one was abolished. Like Dr. DuBridge, Dr. David was interested in how the Federal Council could be made a more effective body and this topic was the subject of discussion at a number of Council meetings. He held an extended "spring review" of research activities of the various departments and agencies—a first—and he sought to involve the Council in a wide range of activities relating to the applications of science and technology in improving the international economic position of the United States, in building stronger Federal, State and local government partnerships in science, and in dealing with the energy problem, among others.

PRESIDENT-FEDERAL COUNCIL RELATIONSHIPS

During the Nixon Administration, only two policy statements of the Federal Council received Presidential endorsement for agency-wide promulgation. One was in 1969, the other 1971. They are excerpted below:

February 21, 1969—Wider utilization of Federal Laboratory equipment: Statement approving wider use of Federal laboratory equipment by university scientists [. . . "While many scientists and engineers from universities now frequently use Federal research facilities, an even closer and more extensive cooperative relation will be productive. I am therefore approving a policy designed to bring this about. Dr. DuBridge will be able to implement the policy with the help of the Federal Council for Science and Technology, which has recommended its adoption."]

August 23, 1971—Government patent policy: Memorandum about Government patent policy [. . . "Based on the

⁵⁴ U.S. Congress. House. Committee on Science and Astronautics. Federal Policy, Plans, and Organization for Science and Technology. Hearings . . . 93d Congress 1st session, July 24, 1973. Washington, U.S. Govt. Print. Off., 1973. p. 154.

results of the studies and experience gained under the 1963 Policy Statement certain improvements in the Policy have been recommended I have approved the above recommendations and have attached a revised Statement of Government Patent Policy for your guidance. As with the 1963 Policy Statement, the Federal Council shall make a continuing effort to record, monitor and evaluate the effects of this Policy Statement. A Committee on Government Patent Policy, operating under the aegis of the Federal Council for Science and Technology, shall assist the Federal Council in these matters.”]

The only other Presidential notice of the Federal Council was the appointment on May 14, 1973, of Dr. H. Guyford Stever, Director of the National Science Foundation, as Acting Chairman. This occurred after the required time had passed for Reorganization Plan No. 1 of 1973 to be disapproved by Congress and Congress had permitted the plan to go into effect.

SUMMARY OF FEDERAL COUNCIL OPERATIONS, 1969–1973

Membership and Attendance

The membership level of the Council remained high during this period with either heads of agencies or representatives at the Assistant Secretary level. A check of attendance at Council meetings in the 1970–1972 period yields some interesting information. It shows that certain departments or agencies tended to be represented at meetings by the designated member rather consistently, while other departments consistently tended to send substitutes to the meetings. An analysis of attendance of 11 departments and agencies at 20 meetings during this time shows that five were represented by substitutes eight or less times while six were represented by substitutes eleven to nineteen times. It is understood that substitutes sent to Council meetings were also policy level representatives. The Council can and has refused to permit non-policy level substitutes to represent department and agency members who cannot be present. In some cases, substitutes were as well or better qualified than the designated members. Sometimes a member brought an associate; upon his departure before the end of the meeting, his associate represented him.

The Council has repeatedly been criticized because departments and agencies send too low level representatives in place of the designated ones. As explained above, it is difficult to make summary generalizations concerning attendance, and especially on the basis of one particular time period. But the period examined was also one of very low visibility for the Council, one during which there was very limited Presidential relationship, and one when attendance by regular members might be expected to be at a minimum. On balance, the situation, at least with respect to the period under examination, is somewhat better than might be expected.

Meetings

Four meetings of the Council were held in 1969. Seven were held in 1970. Eleven were scheduled for 1971 but three were cancelled due to pressures of other business. Through July 1972, seven meetings

were scheduled. One was cancelled, presumably because it was too close to the previous meeting, and another because of the Chairman's absence outside of the country. Council meetings scheduled for October, November and December 1972 apparently were cancelled and not resumed until June 1973.

Staffing

Five executive secretaries served during the 1969-1973 period of the Council:

Charles V. Kidd: November 1964 to July 1969.

Eric B. Ward: July 1969 to November 1970.

David Z. Beckler (acting): November 1970 to February 1971.

Lawrence A. Goldmuntz: February 1971 to October 1972.

Daniel V. DeSimone: October 1972 to December 1973.

Dr. Kidd retired from Government service in July 1969. His successor was Eric B. Ward, a long-time acquaintance of Dr. DuBridge, who served during the remainder of Dr. DuBridge's tenure and left a few months after his departure. In the three-month interval before Dr. Goldmuntz took over, Mr. Beckler served as acting executive secretary. Dr. Goldmuntz had previously been on the staff of the Assistant Secretary for Research and Technology in the Department of Transportation. When he left in October 1972, Dr. Daniel V. DeSimone, from the National Bureau of Standards, took over and remained through the transfer of the Federal Council out of the White House to the National Science Foundation.

Since the Federal Council staff has always been small, usually a part-time Executive Secretary and an assistant, the frequent changes in the Executive Secretary undoubtedly presented problems in maintaining continuity and an institutional memory of previous actions and agreements.

The practice of assigning OST staff to serve as observers and to chair committees of the Federal Council continued throughout this period. In 1969, OST staff served as observers on at least four committees (Academic Science and Engineering, Atmospheric Sciences, International, and Patent Policy). At the same time, and of greater significance, other OST staff served as chairmen of several Federal Council committees as shown below:

OST staff as Chairmen of Federal Council committees

Committee on Academic Science and Engineering: Dr. John S. Steinhart, Chairman, 1969; Dr. Carl York, Chairman, 1970-1972.

Committee on Environmental Quality: Dr. John L. Buckley, Chairman and Executive Secretary 1968-1970.

Committee on Scientific and Technical Information: Col. Andrew A. Aines, Ret., Chairman 1966-1971.

Committee on Water Resources Research: Dr. Warren A. Hall, Chairman, 1970-1971; Dr. W. S. Butcher, Chairman, 1971-1972.

Interdepartmental Committee for Atmospheric Sciences: Carl H. Savit, Chairman 1971.

RANN Coordinating Committee: Dr. Edward E. David, Jr., Chairman 1971-1972.

Automation Opportunities in the Service Sector: Dr. Lawrence Goldmuntz, Chairman 1971-1972.

Energy R & D Goals: Mr. J. Frederick Weinhold, Chairman 1972.

Since OST had only about 25 professional positions on its entire staff to serve the Science Adviser across the spectrum of activity, it would appear that a substantial amount of OST resources was devoted to interagency coordination through the Federal Council and its committees.

Committees

During his first year as Chairman of the Federal Council, Dr. DuBridge and the Council reviewed the existing standing committees and made several changes. Five of the fourteen standing committees were discontinued:

- Committee on Behavioral Sciences
- Coordinating Committee on Materials Research and Development
- Committee on Long Range Planning
- Committee on Solid Earth Sciences
- Technical Committee on High Energy Physics.

The Committee on Behavioral Science and the Long Range Planning Committee had apparently not been active. Federal Council annual reports for 1965-1968 contained no information on activities of either of them.

The Committee on Solid Earth Sciences had completed an inventory and assessment of Federal activities and had strengthened working-level coordinating mechanisms. Since it saw no new emerging areas of concern, the Committee favored its disbandment. Furthermore, an already existing Ad Hoc Interagency Working Group for Earthquake Research was available to coordinate associated activities.

The Technical Committee on High Energy Physics which had been in existence since 1959 was considered now to be no longer needed. High energy research was almost entirely supported by only two agencies, AEC and NSF, and it was the view of the Committee that its coordination function could be continued on an informal basis.

The rationale for termination of the Coordinating Committee on Materials Research and Development (CCMRD) was different from that for the other committees. In this case, a National Materials Advisory Board in the Division of Engineering of the National Research Council, supported by several Government agencies, was also engaged in review of materials problems. Accordingly, the Chairman of the Federal Council disbanded the CCMRD in June 1969. Subsequently the Federal Council, following a study by an ad hoc committee, recommended that a new interagency materials committee be formed within the National Materials Advisory Board. The Annual Report of the National Academy of Sciences for 1969-1970 stated that the National Research Council approved the establishment of an Interagency Council on Materials. Composed of representatives from 12 Federal agencies, the Council met for the first time in August 1970. It continued in existence under the National Research Council until it was replaced in 1974 by a new interagency Committee on Materials, again under the Federal Council for Science and Technology.

During 1969 also, the Committee on Government Patent Policy and the Patent Advisory Panel were reorganized and merged and two groups, on population research and on DOD-domestic agency research, completed their work and were discontinued. The only new committee established was the Ad Hoc Committee on Intergovernmental Science Relations.

In 1970 the Committee on Environmental Quality was abolished and an Ad Hoc Committee on R & D in Relation to Environmental Quality was established, to go out of existence in 1971 upon completion of a report.

When Dr. David took over the chairmanship of the Council, there were ten interagency committees, the smallest number since 1961. During his tenure, two committees were abolished—both upon completion of reports—the Ad Hoc Committee on Intergovernmental Science Relations and the Ad Hoc Committee on R & D in Relation to Environmental Quality.

Seven new committees were established in 1971:

Interagency Committee on Marine Science and Engineering.
Committee on RANN Coordination.

Interagency Committee on Excavation Technology.

Ad Hoc Committee on Ecological Research.

Committee on International Transfer of Technology.

Committee on Energy Research and Development Goals.

Committee on Automation Opportunities in the Service Sector.

Upon Dr. David's departure, the number of Federal Council committees was back up to fifteen, the total at the beginning of 1969.

Table 5 is an extension to earlier charts in this report, showing the evolution of Federal Council committees for the period 1959 to June 1973.

Reports

The last annual report of the Federal Council was for activities during calendar year 1969.⁵⁵ Following a pattern set for earlier reports, the report contained a brief review of Federal Council activities during the year, followed by summaries of activities of the several standing committees. Council membership and rosters of membership of all active committees as of the end of the year were also included. Finally, this and earlier reports each contained a list of reports published by the Federal Council during the year covered, and occasionally a reference to a Federal Council policy paper.

1970 and 1971 passed, without publication of a report covering Federal Council activities. Inquiry to the Federal Council early in 1972 brought forth a response that the 1969 report was indeed the last, but that the report for 1970 would be combined with 1971 and the combined report would be issued in late spring or early summer 1972. A follow-up call in June 1972 revealed that the report was still in draft status and no estimate could be given when it might be available. This report was never published.

Thus, for the last three and a half years of its existence in the Executive Office of the President, the only information about the Federal Council publicly available was an occasional reference to it in testi-

⁵⁵ U.S. Office of Science and Technology. Federal Council for Science and Technology, 1969 Annual Report. Washington, U.S. Govt. Print. Off., 1970. 29 p.

TABLE 5

FEDERAL COUNCIL COMMITTEES AND PANELS, GROUPS, ETC.	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
1959- 1973															
Standing Committee (From 1967— Committee on Federal Laboratories)	E	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	C
Technical Committee on High Energy Physics	E	*****	*****	*****	*****	*****	*****	*****	*****	*****	A 7				
International Committee	E	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	T8
Coordinating Committee on Materials Research & Development	E	*****	*****	*****	*****	*****	*****	*****	*****	*****	A 7				
Interdepartmental Committee for Atmospheric Sciences	E	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	C
Interagency Committee on Oceanography	E	*****	*****	*****	*****	*****	*****	*****	A						
Committee on Long-Range Planning			E	*****	*****	*****	*****	*****	*****	*****	A 7				
Committee on Natural Resources			E	*****	*****	*****	A								
Subcommittee on Water Resources Research			E	M 1											
Committee on Water Resources Research				E	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	C
Committee on Scientific Information				E	*****	M 2									
Committee on Scientific Personnel				E	*****	*****	A 2								
Ad Hoc Panel on Transportation Research					E	A 4									
Patent Advisory Panel					E	*****	*****	*****	M 2						
Committee on Behavioral Sciences					E	*****	*****	*****	A 7						
Committee on Scientific and Technical Information					E	*****	*****	*****	*****	*****	*****	*****	*****	*****	T10
Committee on Government Patent Policy							E	*****	*****	*****	*****	*****	*****	*****	C
Committee on Academic Science and Engineering							E	*****	*****	*****	*****	*****	*****	*****	I11
Ad Hoc Working Group on Solid Earth Sciences								E	M 5						
Committee on Solid Earth Sciences									E	*****	A 7				
Committee on Environmental Quality									E	*****	A				
Ad Hoc Interagency Working Group for Earthquake Research										M 6					
Interagency Upper Mantle Committee										M 6					
Interagency Arctic Research Coordinating Committee										E	*****	*****	*****	*****	C
Ad Hoc Group on Population Research										E	A12				
FCST Study Group on EOD-Domestic Agency Review											E/A 12				
Ad Hoc Committee on Intergovern- mental Science Relations											E	*****	*****	A	

TABLE 5—Continued

	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
Ad Hoc Committee on R&D in relation to Environmental Quality												E13/A13			
Interagency Committee on Marine Science and Engineering													E ****		C
Committee on R&M Coordination													E ****		T10
Interagency Committee on Excavation Technology													E ****		C
Ad Hoc Committee on Ecological Research (Joint FOST-CEA)													E ****		C
Committee on International Transfer of Technology													E ****		C
Committee on Energy Research and Development Goals													E ****		A
Automation Opportunities in the Service Sector													E ****		C
Committee on Forecasting Models														E *	C
Ad Hoc Committee on Domestic Technology Transfer															
Ad Hoc Committee on the International Geodynamics Project															
Interagency Coordinating Committee for Astronomy															
Committee on Materials															
Interagency Task Force on Inadvert. Modific. of Stratosphere															
FOST Operating Committee															
Ad Hoc Committee on Social Research and Development															
Committee on Food Research															

Legend: E = Established
 C = Continuing
 M = Merged
 A = Abolished
 T = Transferred

- 1/ Merged into a new Committee on Water Resources Research
 2/ Merged into a broadened new Committee on Scientific and Technical Information
 3/ Functions taken over by Standing Committee
 4/ Abolished when Department of Commerce assumed direct responsibility for this field
 5/ Merged into Committee on Solid Earth Sciences
 6/ Became subordinate groups of Committee on Solid Earth Sciences
 7/ Abolished June 1969
 8/ Transferred to Department of State, June 1973
 9/ Merged into reorganized Committee on Government Patent Policy
 10/ Transferred to National Science Foundation, June 1973
 11/ Became inactive January 1, 1972
 12/ Discontinued upon completion of its work
 13/ Established 1970; to be disestablished upon publication of report in 1971

mony of the Director, Office of Science and Technology, during congressional appearances on its budget or in connection with specific subjects. Committees continued to function and occasionally published reports. The Council continued to meet, at least until mid-1972. But no composite record of Council and committee activity was made available to the public. Nor is this record publicly available as of this writing.

Each Congress the Clerk of the House of Representatives compiles and publishes a list of reports which it is the duty of any officer or department to make to Congress. Since the Federal Council was established by Executive order, it was never required to submit such a report. Consequently, more information was available to the public about such private corporations as Little League Baseball, Hoover Institution on War, Revolution, and Peace, and the Atlantic State Marine Fisheries Commission than about the activities of the highest level coordinating body for Federal interagency scientific and technical programs.⁵⁶

PROBLEMS CONSIDERED BY THE FEDERAL COUNCIL, 1969-1972

The following summary of subjects considered by the Federal Council has been obtained from limited information in the public record, supplemented by unpublished information made available by the Chairman of the Federal Council. It includes activities of committees of the Federal Council as they were subjects of discussion by the Council.

1969 Activities

The list of subjects considered in 1969 is excerpted from the annual report of the Federal Council for 1969:⁵⁷

The Council considered many matters of interagency interest, including:

- Domestic agency use of R. & D. and technology generated by DOD or other mission agencies;
- DOD programs as a base for innovation and R. & D. on civilian problems;
- Relationships between the Committee on Science and Public Policy of the National Academy of Sciences and the FCST;
- Population research;
- Biomaterial research;
- The future role of FCST as a forum for policy discussion and as a focal point for information exchange;
- Environmental quality;
- Federal R. & D. budgets;
- International science relations;
- Patent policy;

⁵⁶ A description of the Federal Council and its standing committees was included in the Report on the Federal R&D Program, FY 1976, which the Federal Council published in 1976 (Washington, U.S. Govt. Print. Off., 1976) at pp. 160-165. It is understood that an activities report on the Federal Council and its committees was in preparation during the early part of 1976. The period expected to be covered in this report is not known.

⁵⁷ Federal Council for Science and Technology, 1969 Annual Report, op. cit., p. 2.

- Assisting State and local governments to make better use of science and technology;
- R. & D. activities at the AEC;
- Guidelines on exchange of unclassified scientific and technical information with countries with which we have no diplomatic relations;
- R. & D. programs and plans at the Department of Health, Education, and Welfare; and
- Strengthening scientific relations with France, Romania, and Yugoslavia.

1970 Activities:

The following subjects were considered by the Council in 1970:

Clearance procedures for hiring advisers and consultants, with particular reference to HEW.

Implications of Federal Executive Service proposal to put all executive, policy level and senior scientist and engineering positions on 5-year terms with annual renewals—Difficulties in recruiting and holding scientists and engineers if adopted.

Impact of Mansfield amendment requiring relevance tests for the future of basic research.

Utilization of Federal laboratory facilities—Closing unneeded facilities or changing their role.

Effectiveness of the Federal Council—Evaluation of and suggestions for improvement. (See Section II, above.)

Government patent policy—Revised Presidential memorandum and statement.

Federal Council committees: Discussions of proposed Committee on Food and Nutrition Research and Education; status of Committee on Academic Science and Education; discontinuation of Committee on Environmental Quality; activities and future role of Committee on Scientific and Technical Information.

Weather modification—Status and implications of research.

International cooperative scientific programs, such as International Biological Program.

Interdisciplinary research—Interagency funding.

Technology assessment—Importance of the process and lack of ongoing Executive branch activity.

International standards—Importance of increased attention by United States.

Relative position of United States science and technology effort.

Public education on science and technology issues.

Proposed Presidential report on science and technology in United States.

1971 Activities:

These subjects were considered by the Council in 1971:

FY1972 R & D budget.

Spring preview of technical issues.⁵⁸

Research Applied to National Needs program of the National Science Foundation—Establishment and progress report.

New Technological Opportunities Program—Domestic Council evaluation.

Report of Commission on Government Procurement—Discussion.

Interagency utilization of Federal laboratories—Proposed policy.

DOD's Project Reflex⁵⁹—Report.

Energy R & D Goals—Report of Electric Research Council; Establishment of FCST Committee on Energy R & D Goals; Progress report on contractor study supporting the committee.

Federal Council committees: New committees approved: Energy R&D Goals, Marine Science and Engineering, Automation Opportunities, RANN Coordination. Discussed establishment of Committee on High Technology, Markets, Exports and Licensing. Establishment of Ad Hoc Committees on Ecological Research and Environmental Health approved.

Amendment of Executive Order 10807 to change EPA from observer to member status—In process.

Committee reports approved for publication: ICAS Report No. 15, 1969–70, Annual report on Government patent policy, Environmental quality R&D, Revised COSATI standards for microfiche.

Technology assessment—Review of OST contract study.

1972 Activities:

Topics considered by the Federal Council through mid-July 1972 were:

FY 1973 budget.

Final report of Commission on Government Procurement.

Effect of Civil Service directives to reduce grade levels, total work force levels.

NSF–NBS Experimental incentives programs for technology stimulation reviewed.

⁵⁸ Science and Government Report, June 15, 1971, p. 4: “. . . Director Edward E. David Jr. recently called in officials of virtually every federal research agency for an unprecedented ‘spring review’ at which each was required to describe his organization’s R&D activities and how they relate to the objectives of the parent organization and the Administration. . . .”

⁵⁹ This was an experimental program to manage laboratories without specific manpower ceilings but through budgetary control of allocated funds.

Office of Technology Assessment—Report on congressional interest and action.

“Limits to Growth”—Review, discussion on Federal options.

Federal Council committees: Interim report of Ad Hoc Committee on International Transfer of Technology approved for release; Interim report of Energy R&D Goals Committee presented; 1st annual report of Interagency Committee on Excavation Technology approved; Final report of Committee on Intergovernmental Science Relations approved with incorporation of agency reservations before distribution.

Patent policy changes—Report on recent and prospective changes agreed to.

New FCST committees approved: Interagency Committee on Large-Scale Simulation; Reconstitution of Arctic Coordinating Committee.

Interagency cooperation in utilization of Federal laboratories—Discussion; Policy statement delayed pending resolution of manpower issue.

International scientific cooperation: Sharing U.S.-French science facilities; U.S.-U.S.S.R. cooperation.

Executive Order 11671, “Committee Management”—Reviewed, implications for Federal Council committees.

No information was made available on Federal Council meetings after July 1972, until the June 1973 meeting under Acting Chairman H. Guyford Stever.

TWO BRIEF CASE STUDIES

Assisting State and Local Governments To Make Better Use of Science and Technology

Under Chairman DuBridge and Executive Secretary Eric Ward, the Federal Council interest in strengthening the scientific and technical capabilities of State and local governments was sparked by the creation of an ad hoc Committee on Intergovernmental Science Relations in October 1969. The committee, made up of representatives from 20 Federal agencies, including Dr. DuBridge and Mr. Ward representing OST, conducted a series of eleven meetings around the country as part of a two-year effort to—

Inventory and evaluate the impact of Federal policies and programs on the scientific and technological activities of State and local governments.

Inventory State and local science and technology activity and appraise its relation to Federal programs.

Formulate, in consultation with representatives of State and local governments, recommendations for Federal initiatives to strengthen this activity and Federal cooperation with it.

Identify the need for scientific resources, including manpower and institutional requirements, of State and local governments, and assess the adequacy and impact of Federal programs bearing on these needs.

Recommend policies, procedures and programs to improve management, information exchange, planning, and coordination of Federal science and technology activities with related activities of State and local governments.

The committee's report, "Public Technology: A Tool for Solving National Problems," issued in May 1972, and a companion report by the Council of State Governments, "Power to the States: Mobilizing Public Technology," were the bases for a National Action Conference on Intergovernmental Science and Technology Policy held in Harrisburg, Pennsylvania, in June 1972, to which over two hundred leaders from all levels of government, academic institutions and industry, from across the country, came. The conference and resolutions adopted at the conference were reviewed in a subsequent report, "Action Now: Partnerships—Putting Technology to Work," published in August 1972 by the Pennsylvania Office of Science and Technology.

In later years of the Nixon Administration, the interest in continuing this Federal-State-local science and technology interface lapsed. It continued to be a subject of concern in the Congress. The provision for the establishment of an Intergovernmental Science, Engineering, and Technology Advisory Panel in the new Office of Science and Technology Policy by the National Science and Technology Policy, Organization and Priorities Act of 1976 is a legislative attempt to direct renewed attention to the problems at State, regional and local levels which can be addressed by science, technology, and engineering.

The New Technological Opportunities Program (NTOP) and the President's Message on Science and Technology

Calendar year 1971 began at a low point in the U.S. economy. Efforts to reduce unemployment and curb inflation by means of monetary and fiscal policies had failed to achieve their purpose and on the international front, a deficit in the United States overall balance-of-trade position was predicted—the first since 1893. The Administration mounted a new effort to redress the situation. This focused on stimulating the use of existing and the development of new technology in order to maintain the preeminence of American technology in the world market.

The New Technological Opportunities Program (NTOP) which the effort was named got underway in the Domestic Council on July 1, 1971, when Presidential Assistant John D. Ehrlichman sent letters to 15 government agencies inviting their suggestions for technological ideas whose development and promotion might strengthen the domestic or foreign economic position of the United States. As responses were received, they were forwarded to OST for evaluation and assessment. In mid-August 1971, William M. Magruder, who had directed the SST program in the Department of Transportation, was named to head the NTOP. The appointment was greeted with surprise because as Director, OST, Dr. David might have been a logical choice. Lawrence A. Goldmuntz, OST technical staff assistant and Executive Secretary of the Federal Council was assigned the job of liaison between the Domestic Council and OST for this effort.

Throughout the remainder of 1971, Magruder and his staff, working with OST, evaluated the proposals and worked to present a meaningful program for inclusion in the fiscal year 1973 budget. Toward the end

of 1971, Mr. Magruder assembled a special project team to compile the final listing of projects.

The FY 1973 budget message contained a \$1.4 billion increase for Federal R&D over the previous year; this represented a \$700 million increase for civilian research and development. But the only truly new technological programs were the experimental incentives programs for which \$40 million was allocated between the National Science Foundation and the National Bureau of Standards.

The President indicated in his budget message that he would have more to propose "subsequently" on "how we can accelerate the effort I began 3 years ago to turn science and technology to the service of man." Consequently, the contents of his message to the Congress of March 16, 1972 on science and technology⁶⁰ were eagerly examined for indications of additional Administration initiatives in implementing further the NTOP.

The message on science and technology originated in OST. Dr. David had discussed the subject with the Federal Council in 1970. While it was the first Presidential message ever sent to the Congress on science and technology, it contained no new proposals to stimulate industrial research and development other than those already in the FY 1973 budget, and to that extent it was disappointing.

The record is not clear on the role of the Federal Council in this endeavor. A Committee on International Transfer of Technology was established in August 1971 and continued until 1974. There is evidence that NTOP was a topic of discussion at several Council meetings in 1971, but the degree of involvement is not known. Also, it is not clear whether Dr. Goldmuntz was involved in his position as an OST staff member or as Executive Secretary of the Federal Council.

In retrospect, the NTOP effort made all who were involved in it recognize the complexity of the R&D process and the necessity to take into account such factors as "customs, mores, politics, existing structures and a whole host of things"⁶¹ when trying to link it to the economy.

RUMORS OF REORGANIZATION, 1972-1973

During 1972, interested observers began to see indications that changes in the Executive Office science advisory structure were under consideration. A lead article in *Science and Government Report* June 15, 1972,⁶² began: "Widespread rumor has it that the Nixon Administration intends the post-election demolition of the Office of Science and Technology (OST) and the President's Science Advisory Committee (PSAC), and plans to replace them with a council that will put a combine of technology, industry, and finance high up in White House dealings with research and development." *Engineering News Record* of October 26, 1972, contained a brief report, under a headline "Nixon plans to revamp the science advisory system," that if reelected President Nixon wanted to shift emphasis from basic research to applied science, and that a newly organized science and engineering council from the Committee for the Reelection of the

⁶⁰ U.S. President. Message on Science and Technology. Congressional Record (daily ed.) v. 118, Mar. 17, 1972, pp. S4169-S4173.

⁶¹ Edward E. David in Claude E. Barfield, Science report/White House Views Intense Technology Hunt as Useful Exercise, Though Few Projects Emerge. National Journal, v. 4, May 6, 1972, p. 765.

⁶² "The White House and R&D: New Structure in the Offing," pp. 1, 2.

President, under William O. Baker, was expected to "swallow up" the Science Advisory Committee (PSAC). The article concluded with "White House watchers expect science advisor Edward E. David, Jr., to be replaced by a three-man council of technical advisors."

Again, *Science and Government Report*, of December 15, 1972, in a story, "No official word yet on White House Science Reshuffle," reported that the President was continuing organizational changes and was presently "working around the layer that includes the White House science office and associate organizations." The article noted that while Science Adviser David was expected to stay on, "rumors persist that something of a drastic nature may happen to David's Office of Science and Technology and the President's Science Advisory Committee, but several people who would ordinarily know about such things say that a bit of readjustment and perhaps tighter linkage to the Office of Management and Budget and the Domestic Council are all that is planned at present." Subsequent events belied the prediction.

Early in January 1973 Dr. David resigned as Science Adviser and left immediately to take a position in private industry. By mid-January 1973, the press was reporting that the Office of Science and Technology and the President's Science Advisory Committee were expected to be terminated or altered⁶³ and a week later the imminent removal of these units was reported as a certainty.⁶⁴

REORGANIZATION PLAN NO. 1 OF 1973 IS SENT TO CONGRESS

On January 26, 1973, President Nixon sent Reorganization Plan No. 1 of 1973 to the Congress, with an accompanying message.⁶⁵ The plan proposed to abolish the Office of Science and Technology and to transfer functions vested in OST to the Director, National Science Foundation. Also to be abolished were two other Executive Office units—the Office of Emergency Preparedness whose functions were transferred to the President of the United States, and the National Aeronautics and Space Council, whose mission was considered to be accomplished.

The rationale for the reorganization plan was that it was part of a three-part program announced by the President on January 5, 1973, to streamline the executive branch of the Federal Government. The components of the program were:⁶⁶

The first part of this program is a renewed drive to achieve passage of my legislative proposals to overhaul the Cabinet departments. Secondly, I have appointed three Cabinet Secretaries as Counsellors to the President with coordinating responsibilities in the broad areas of human resources, natural resources, and community development, and five Assistants to the President with special responsibilities in the areas of domestic affairs, economic affairs, foreign affairs, executive management, and operations of the White House.

⁶³ Cohn, Victor. Nixon May Drop Unit On Science. *Washington Post*. Jan. 13, 1973, pp. A1, A5.

⁶⁴ Cohn, Victor and Stuart Auerbach. Leading Role in Science Will Shift to NSF. *Washington Post*, Jan. 20, 1973, p. A4.

⁶⁵ U.S. President. Reorganization Plan No. 1, 1973. Message from the President of the United States transmitting Reorganization Plan No. 1 of 1973. Washington, U.S. Govt. Print. Off., 1973. 93d Congress, 1st session. House Document No. 93-43.

⁶⁶ *Ibid.*, p. II.

The third part of this program is a sharp reduction in the overall size of the Executive Office of the President and a reorientation of that office back to its original mission as a staff for top-level policy formation and monitoring of policy execution in broad functional areas. The Executive Office of the President should no longer be encumbered with the task of managing or administering programs which can be run more effectively by the departments and agencies. I have therefore concluded that a number of specialized operational and program functions should be shifted out of the Executive Office into the line departments and agencies of the Government. Reorganization Plan No. 1 of 1973, transmitted herewith, would effect such changes with respect to emergency preparedness functions and scientific and technological affairs.

The message reviewed the circumstances leading to the establishment of the Office of Science and Technology and the transfer of functions to it from the National Science Foundation. It noted further that the Foundation has subsequently broadened its ability to play a "coordinating and evaluative role within the Government and between the public and private sectors" and that therefore a transfer back of functions from the OST was in order. The message noted the President's intent to ask Dr. H. Guyford Stever, Director, National Science Foundation, to take on the additional post of Science Adviser, and also to act as the President's representative in international scientific affairs, and "when appropriate" to assist the Department of Defense in advising the President in national security matters.

Neither the message nor the reorganization plan mentioned the Federal Council for Science and Technology. Dr. Stever was asked about the Council and said that it was expected to be replaced by a new Science Policy Council which would have many of the same functions but a different method of operation and would not be in the White House.⁶⁷

A month later when Dr. Stever and Administration officials appeared at hearings on Reorganization Plan No. 1 of 1973, a decision had not yet been made whether to continue the Federal Council or set up a new body.⁶⁸ OMB witnesses Fred Malek and Charles F. Bingman discussed the future of the Federal Council with House Government Operations Committee Chairman Chet Holifield.⁶⁹

FUTURE OF FEDERAL COUNCIL

Chairman HOLIFIELD. Dr. Stever announced that he may establish a science policy council to replace the Federal Council for Science and Technology, an interdepartmental coordinating group. Why would this change be necessary? What would be the difference in the responsibilities of that group?

⁶⁷ NSF press briefing January 26, 1973 by Dr. Stever.

⁶⁸ U.S. Congress. House. Committee on Government Operations. Reorganization Plan No. 1 of 1973 . . . Hearing before a Subcommittee of the . . . 93d Congress 1st session, Feb. 26, 1973. Washington, U.S. Govt. Print. Off., 1973, 191 p. at p. 66.

⁶⁹ Ibid., p. 12.

Mr. MALEK. I don't think there would be any real difference in the responsibility. I think his intent really is to establish a coordinating body so that there can be a useful interchange of ideas in the scientific area.

Mr. BINGMAN. If I may add a word, sir, I think there are a number of members on the existing council who have left their posts and need [to] be replaced. I think this is seen as an opportunity to reexamine once again the validity of the numbers and kinds of Federal members on this committee, with the intent of perhaps upgrading its membership and giving it a somewhat broader role.

Later, Dr. Stever discussed the Federal Council when responding to a question from Staff Director Herbert Roback: "... Do you anticipate that you will be able to discharge the responsibilities of governmentwide coordination in science matters?"

Dr. STEVER. Governmentwide coordination? I think we will be able to do a reasonable job there.

You know, a lot of people feel that coordination is something that everybody resists. I want to tell you that as soon as this job was announced, a number of people came up to me and said, "You must make sure that the following"—and they would name the functions of the Federal Council on Science and Technology, for example—"is either retained or strengthened," because they knew that the National Science Foundation has experience in which we know this coordination is important—in our RANN program, in our oceanography programs, and in a number of areas where we share programs with other agencies.

So there is not resistance to coordination on the part of agencies.

When an agency feels it has a clear directive and a responsibility in science and technology to do a job, they try to do it as well as they can, and they use all of the channels they can to get that support. But if they know that they share that responsibility with others, they generally look forward to coordination.

The Federal Council was not discussed in the House report⁷⁰ on the plan, except that its existence was noted and the fact that it was not part of the formal reorganization plan, since it was created by executive order.

No member of Congress filed a disapproving resolution on the reorganization plan so no further action was taken beyond the hearings in each House and the filing of the House report. Undoubtedly a factor influencing congressional action or lack of it on the reorganization plan was its limited option. Executive reorganizations submitted to Congress under the Reorganization Act of 1949, as amended⁷¹ had to be accepted or rejected in total. No amendment was permitted.

⁷⁰ U.S. Congress. House. Committee on Government Operations. Reorganization Plan No. 1 of 1973 (Office of Emergency Preparedness, Office of Science and Technology, and National Aeronautics and Space Council). Second Report of the . . . April 4, 1973. Washington, U.S. Govt. Print. Off., 1973, 93d Congress, 1st session, House Report No. 93-106.

⁷¹ 5 U.S.C. 901-913 (1970 ed.), as amended by P.L. 92-179 of Dec. 10, 1971, which extended the President's reorganization authority to April 30, 1973. This authority has not been extended subsequently.

The House Committee on Government Operations expressed a sentiment apparently widely held in the Congress that "the President cannot be compelled to utilize a policymaking and advisory apparatus in the Executive Office against his own preferences. Furthermore, the President should have considerable latitude in determining the composition of the Executive Office."⁷²

TRANSFER OF THE SCIENCE ADVISORY AND COORDINATING FUNCTIONS TO THE NATIONAL SCIENCE FOUNDATION

The 60-day period for Congress to act on Reorganization Plan No. 1 of 1973 ended on April 5, 1973, but as provided for in the plan, it did not go into effect until July 1, 1973. During this period the Federal Council met informally on March 5, 1973, with Dr. Stever presiding, and questions relating to the operation and future role of the Council and its committees were discussed.

On May 14, 1973, President Nixon announced the designation of Dr. Stever to be Acting Chairman of the Federal Council. The first formal meeting of the Council under Dr. Stever was held on June 5, 1973.⁷³ A Presidential letter of July 1, 1973 designated Dr. Stever to be Chairman of the Federal Council, and an NSF press release of July 2, 1973, announcing the establishment of a Science and Technology Policy Office in the National Science Foundation to assist the Science Adviser, noted that STPO would provide staff support to the Federal Council.

Thus ended another period in the history of the Federal Council for Science and Technology and a new period began. Just as the Interdepartmental Committee on Scientific Research and Development had been transferred to the National Science Foundation more than two decades earlier, so was its successor, the Federal Council, transferred out of the Executive Office of the President to the National Science Foundation. The Federal Council and its committees was the only part of the former Executive Office science advisory structure to survive the reorganization.

⁷² H. Rept. 93-106, op. cit., p. 13.

⁷³ See next section.

VI. THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY AFTER TRANSFER TO THE NATIONAL SCIENCE FOUNDATION (1973-1976)

It was almost three years to the day from May 14, 1973, when President Nixon designated NSF Director and Science Adviser-designate H. Guyford Stever to be Acting Chairman of the Federal Council, to May 11, 1976, and the signing by President Gerald R. Ford of the National Science and Technology Policy, Organization and Priorities Act of 1976. Title IV of this Act abolished the Council and established a Federal Coordinating Council on Science, Engineering, and Technology in its stead. The Chairman of the new Federal Coordinating Council will be the Director of the Office of Science and Technology Policy in the Executive Office of the President, which is also established under the Act. As of early July 1976, a nomination for this position had not been announced.*

Continuity of interagency coordination during the interim period from the signing of the Act to the time when a new Director is selected is being maintained by the Federal Council for Science and Technology. Although technically abolished, the Federal Council is operating in the spirit of the intent expressed in the Joint Explanatory Statement of the Committee on Conference on the National Science and Technology Policy, Organization, and Priorities Act of 1976 concerning Title IV relating to the Federal Coordinating Council for Science, Engineering and Technology which states in part:¹

... The effect of this title is to make the existing Federal Council for Science and Technology, set up by Executive Order in 1959, a statutory body with the Director of the new Office as chairman. ... The title adds no new functions. It does change the name of the present Council, emphasizes its mission, and places it on a statutory basis. ...

This final section summarizes the operations and activities of the Federal Council for Science and Technology during the past three years. It is intended to provide a point of departure from which to consider the future role, structure, and operation of the new Presidential level interagency coordinating council for science, engineering, and technical activities.

TRANSFER TO THE NSF

The Office of Science and Technology which had provided staffing and space for the Federal Council was not formally abolished until the close of business June 30, 1973. Although Reorganization Plan

*On July 21, 1976, the nomination of Dr. H. Guyford Stever to be Director, Office of Science and Technology Policy, was announced by President Ford.

¹U.S. Congress, Committee of Conference, Science and Technology Policy, Conference Report [To accompany H.R. 10230] April 26, 1976. Washington, U.S. Government Printing Office, 1976. 94th Cong. 2d sess. H. Rept. 94-1046, p. 19.

No. 1 of 1973 could have been effective as of April 5, 1973 (the end of the 60-day period for congressional disapproval) an effective date of July 1, 1973, had been specified in the plan for the changes to go into effect. So the Federal Council was not formally transferred to the NSF until the latter date.

The transfer from the Executive Office of the President is understood to have been a two-stage process, involving a precipitous intermediate move within the Executive Office of the President. In the process, collections of reports of the Federal Council and its committees accumulated over the years were hurriedly dispersed. As a result, a degree of continuity was lost which was never recovered during the remainder of the Council's existence.

SCIENCE ADVISER-FEDERAL COUNCIL RELATIONSHIPS

It seems to have been generally assumed in 1973 when Reorganization Plan No. 1 was made public that the Federal Council, although established on a different statutory basis, would also be abolished. Dr. Stever had told the press that when he assumed his new duties, he intended to establish a Science Policy Council as an interagency coordinating body to replace the Federal Council for Science and Technology. As late as the third week of February 1973, a month after the Reorganization Plan had been sent to Congress, the future role of the Council was still in doubt, according to OMB witnesses.

By early March, a decision to continue the Council had apparently been made. Dr. Stever met informally with members of the Federal Council to discuss its future, its mode of operation, and the 15 committees under it. During the first week in April, a review of the activities and need for each of the interagency committees was conducted. On the basis of this information and discussions with Council members and committee chairmen, Dr. Stever was able to make certain recommendations concerning the Council when he met formally with it at the first plenary session of 1973 on June 5.

A principal agreement at this meeting was a decision to reduce the number of plenary meetings of the Council per year, but provide for additional and special or ad hoc meetings under certain circumstances. Also at this meeting, the status of each committee was reviewed and a decision was made whether or not to continue that committee under Federal Council aegis.

It is known that previous Federal Council chairmen had conducted reviews of the Federal Council and sometimes of its committees in an attempt to make it a more effective body.² Apparently none of these previous reviews was as extensive as that conducted by Dr. Stever. The amount of attention he gave to the Council, busy as he was, signified a recognition of the potential value of the Council. The record shows that he continued to give thought to improvements in the Council's operations throughout the period under consideration.

In 1975, Dr. Stever informed a Senate Appropriations subcommittee that the Council decided at its plenary meeting of November 1974 to conduct a "comprehensive review of its charter, membership, and

² Both Dr. DuBridge in 1969 and Dr. David in 1970 did this. Dr. David extended this discussion over several meetings. Following Dr. DuBridge's review of standing committees early in 1969, a decision was reached to discontinue five of them.

objectives," and he said, "... this work is underway,"³ No information was found on the results of this review.

The record does not show that Dr. Stever ever discussed Federal Council or committee activities with either President Nixon or President Ford or that either President gave a specific endorsement to any Federal Council recommendations. Dr. Stever did discuss Federal Council activities in appearances before committees of the Congress on numerous occasions, and he welcomed the idea of the Council's being given statutory basis.

SUMMARY OF FEDERAL COUNCIL OPERATIONS WITHIN NSF

PHYSICAL LOCATION WITHIN NSF

As an organizational entity, the Federal Council has been almost invisible. It has been occupying space within the Division of Policy Research and Analysis (PRA) in the Directorate for Scientific, Technological, and International Affairs (STIA), in the National Science Foundation, at 1800 G St. N.W. PRA was reorganized, effective in February 1976, by bringing together a number of related offices, including the Science and Technology Policy Office (STPO) and an Office of Energy R. & D. Policy, both of which had been established in 1973 to provide staff assistance to the NSF Director in his capacity as Science Adviser. Staff support for the Federal Council was formerly from the STPO and continued to be made available from STIA.

The Executive Secretary, who also serves as Group Leader of a section for the analysis of emerging science and technology within the Division of Policy Research and Analysis of STIA, has been occupying a large, well-furnished office, comparable to other section leaders within PRA. His Administrative Assistant has had a desk and limited storage space in a large outer room, shared with several other people and somewhat removed from the Executive Secretary. Dr. Stever's office has been on another floor of the same building. Meetings of the Federal Council have been held in the National Science Foundation conference room.

It is the expectation that the Federal Council staff will be a part of the new Office of Science and Technology Policy when it is established in the Executive Office of the President.

STAFFING

The current Executive Secretary is William C. Bartley, who assumed this position effective March 16, 1976. Mr. Bartley, as noted above, also heads a section within PRA on emerging science and technology issues (health of basic science, the screening of emerging technologies for policy implications, and the national S&T posture). This position is budgeted at EEI (executive excepted) under the NSF authority in 42 U.S.C. 1873, and is comparable to General Schedule (GS) 16 in the classified civil service.

³ U.S. Congress. Senate. Committee on Appropriations. Department of Housing and Urban Development and Certain Independent Agencies Appropriations, fiscal year 1976. 94th Congress, 1st session. Part 1, p. 153.

The Executive Secretaries who have served under Dr. Stever as Chairman have been:

Daniel V. DeSimone, October 1972 to December 1973.

Russel C. Drew, Director, STPO (Acting Exec. Secy.), January 1974 to March 1975.

John V. Granger, March 1975 to March 1976.

William C. Bartley, March 1976 to present.

The only full-time staff member of the Federal Council is the Executive Secretary's Administrative Assistant, at grade GS-8.

If one were figuring total staffing of the Council it would be necessary to allocate a portion of Dr. Stever's time in preparing for and serving as Chairman of Federal Council meetings, and in handling Council business between meetings. Finally, the time devoted to Council Business which the Federal Council members and the Operating Committee contribute in preparation for meetings and for the members in attending meetings is an additional factor.

STAFFING OF INTERAGENCY COMMITTEES

During the existence of the Office of Science and Technology it had been an accepted practice for the Director to assign OST staff members to chair some Federal Council interagency committees and to attend meetings of other committees as observers. This practice was continued by Dr. Stever. Members of the Science and Technology Policy Office, later Policy Research and Analysis, have served as Executive Secretary of the Social Research and Development Committee, of the Ad Hoc Committee on Domestic Technology Transfer, and of the Interagency Committee on Excavation Technology; STPO staff have been observers on the Arctic Research Coordinating Committee, the Government Patent Policy Committee, and the Interagency Committee on Atmospheric Science. Staff members of the National Science Foundation chaired four other committees but in their capacities outside the science advisory support staff to Dr. Stever.

Approximately 225 Federal officials presently serve either as members or observers of the interagency committees and task force under the Federal Council. Staffing needs for these committees are commonly met by the committee chairmen from within their departments and agencies.

CREATION OF OPERATING COMMITTEE

Creation of a standing committee, to be known as the FCST Operating Committee, was approved at the June 1975 plenary meeting of the Federal Council. The Committee has been composed of individuals from each member department and agency who have had the responsibility to provide staff support to the principals representing their agencies on the Federal Council. The Executive Secretary of the Federal Council ex officio has been serving as Chairman of the Operating Committee. The functions of the Operating Committee include developing an agenda for each plenary session of the Council, insuring that the supporting documentary for plenary meetings is prepared and made available, preparing drafts of guidelines and procedures for consideration by the Council, and such other functions as the Chairman or Executive Secretary may assign. It is understood that

the Operating Committee met almost monthly with the Executive Secretary in preparation for the last Council plenary meeting.

FUNDING

At the time of its creation, the Science and Technology Policy Office within NSF was assigned the job of providing staff support for the Federal Council. During its existence, the Office of Science and Technology had provided this support; before its establishment, the Office of the Special Assistant to the President for Science and Technology had done so. The Federal Council has never had its own budget. However, during the past three years, the STPO Director allocated a "modest" amount of his office's budget for the Federal Council to be used for such items as stationery, the publication of reports, or the sponsoring of an occasional workshop. While the value of contributing to Council expenses by member agencies is recognized, this method is more costly and time-consuming than obtaining funds from a single source.

CHANGES IN FEDERAL COUNCIL MEETINGS

As a result of an initial review and discussions with members during the spring of 1973 concerning how the Council might be made more effective, a decision was made at the June 1973 meeting to alter its meeting schedule. Instead of scheduling meetings at approximately monthly intervals as had been the practice since its establishment, the Council agreed to hold only two formal plenary sessions each year and to hold additional meetings only when the subject was of interest to all members. Special or ad hoc meetings of subgroups of the Council could be called, and all members of the Council were to be notified and given an opportunity to attend if they cared to.

Following its transfer to the National Science Foundation, the Federal Council has held six plenary meetings, four special meetings, one informal meeting, and one executive session on the following dates:

Plenary meetings

June 5, 1973
Nov. 7, 1973
Apr. 11, 1974
Nov. 7, 1974
June 12, 1975
Dec. 9, 1975

Special meetings

March 5, 1973 (informal)
Nov. 1, 1973 (executive)
Dec. 18, 1973 (telecommunications research)
Jan. 1974 (technology transfer)
Feb. 6, 1976 (inadvertent modification of the stratosphere)
Feb. 23, 1976 (do)

The alteration in the meeting schedule was a move to upgrade the participation in Council meetings. STPO Director Drew explained the desire of Federal Council members to meet less frequently but on more important major issues. He expressed a general agreement that this would both "strengthen the operation and bring it to top level attention. If you get top level people and try to have them meet bi-weekly," he said "gradually you will reduce the level of attendance and participation."⁴

⁴ U.S. Congress. House. Committee on Science and Astronautics. 1975 National Science Foundation Authorization. Hearings, 93d Congress, 2d session on H.R. 12816. Washington, U.S. Government Printing Office, 1974, p. 766.

In the period preceding transfer to the NSF, Council meetings were generally held in the afternoon and lasted about two hours. Since the number of them has been reduced, the length of the meetings has been extended generally to either all morning or all afternoon, often including a light lunch, to save time.

ATTENDANCE AT COUNCIL MEETINGS

It has become common in recent years at least for several of the departments and agencies to have more than the designated Council representative attend meetings. Recent attendance lists do not differentiate between members, guests, or observers as was done at an earlier period. The Executive order which established the Federal Council and the one which amended it specified the membership to include the Special Assistant to the President for Science and Technology and representatives from eleven departments and agencies, with an observer from the Office of Management and Budget. However, the Chairman was authorized to request that the heads of other agencies not enumerated designate representatives to participate in meetings on matters of concern and the Chairman could also invite other persons to attend meetings of the Council. In January 1975, Dr. Stever told the House Committee on Science and Technology that the Federal Council had "members and observers from all 22 Federal R. & D. performing agencies and the OMB."⁵

Even with fewer meetings per year, not all the designated Council representatives could attend all the meetings and sent substitutes on occasion. Available information on this period showed that only one department consistently sent substitutes: the others had a mixed attendance record. On balance, attendance has probably been better than previously.

ENLARGING THE COUNCIL MEMBERSHIP

Formally expanding the membership of the Federal Council beyond that provided in the original executive order and the 1967 amendment was considered in 1971 and again in 1974. The problem was that agencies established since 1967—such as the Environmental Protection Agency, Federal Energy Administration, or Office of Telecommunications Policy, which have significant science and technology components—could be invited by the Chairman to attend Council meetings but could not become members unless the Council's statutory authority was amended. A further concern was that in departments as large as HEW, a single representative did not reflect the different points of view. This latter situation was resolved by Council agreement in the spring of 1974 that additional representatives from an agency or department could be invited by the Chairman to attend meetings but only one person could formally represent each department. Adding to the membership was a subject planned to be taken up at the Fall 1974 meeting. Before that meeting was held, the Senate had passed S. 32 which provided for statutory basis for the Council and an enlarged membership. These provisions were subsequently incor-

⁵ U.S. Congress. House. Committee on Science and Technology. National Science Foundation Briefing to the Committee on Science and Technology. Hearing, 94th Congress, 1st Sess. Jan. 31, 1975. Washington. U.S. Government Printing Office, 1975, p. 26.

porated into the final version of the National Science and Technology Policy, Priorities and Organization Act of 1976.

DESCRIPTIVE SUMMARY OF THE FEDERAL COUNCIL IS PUBLISHED

The Report on the Federal R. & D. Program Fiscal Year 1976,⁶ which the Federal Council issued when the fiscal year 1976 budget was presented, contains the first brief descriptive summary of the Federal Council, including its committees, that has been published since the last annual Federal Council report for 1969. This summary contained brief information concerning activities of the several committees but the portion concerning the Council proper did not include comparable details on subjects it had been concerned with.

Despite the publicity given to the report by the 1975 hearings of the Special Oversight subcommittee of the House Committee on Science and Technology⁷ and the expressed interest in future similar reports, with modifications, the Council decided not to do a follow-on report. The Science Adviser proposed that in its place, a report from him to the President be prepared which would provide an analytical treatment of selected scientific and technological issues.

FEDERAL COUNCIL ACTIVITY REPORT

At its last meeting in 1975, the Council agreed that an activity report should be prepared. To be essentially an expansion of the information contained in the Report on the Federal R. & D. Program Fiscal Year 1976, discussed above, the report is expected to contain a brief historical summary of the Council including authority, functions and organization, a summary of administrative and policy and program actions for 1975-1976, and a current list of Council members and observers. It will also include a summary of 1975-1976 functions and activities for each committee and task force as well as a list of major published reports. As of this writing, this report was understood to be still in preparation.

FEDERAL COUNCIL ACTIONS REGARDING ITS INTERAGENCY COMMITTEES

A considerable amount of time at meetings of the Federal Council appears to have been spent on business related to its interagency committees. This includes reviews of past activities of the committees, discussions of current activities, consideration of the need for existing committees to continue either under the Federal Council or other auspices, and arriving at decisions to establish new committees.

ANNUAL REVIEW OF COMMITTEES AND COUNCIL ACTIONS

Each spring in 1973, 1974, and 1975, the Council members reviewed reports from each of the committees concerning its activities. These

⁶ U.S. Federal Council for Science and Technology. Report on the Federal R. & D. Program, Fiscal Year 1976. Washington, U.S. Government Printing Office, 1975, 165 pages, pp. 161-165.

⁷ U.S. Congress, House, Committee on Science and Technology. Subcommittee on Domestic and International Scientific Planning and Analysis. Annual Report on Federal Research and Development Program, Fiscal Year 1976: Special Oversight Hearing. Hearings, 94th Congress, 1st session, June 3-5, July 10, 1975. Washington, U.S. Government Printing Office, 1975, 133 pages.

review sessions formed the basis for determining whether changes needed to be made; that is, whether each committee should continue, whether its mission had been accomplished and there was no longer a need for it, or whether its activities should be transferred to a lead agency.

As a result of the 1973 reviews, the International Committee, which had been established as a Federal Council committee in 1959, was transferred to the Department of State, the lead agency. Two other committees, RANN Coordination, established in 1971, and Scientific and Technical Information, established in 1964, were transferred to their lead agency, the National Science Foundation. The Committee on Energy Research and Development Goals was terminated as a Federal Council committee with the completion of its reports and the establishment of other energy coordinating bodies within the Executive Office. In 1975 the Automation Opportunities in the Service Sector ad hoc committee was placed in inactive status, following the publication of its report.

On occasion the recommendation to transfer a committee out from Council sponsorship has met with resistance. Such was the case with the long-standing Committee on Water Resources Research, established in 1962. A proposal to transfer it to the Department of the Interior was defeated by strong Council opposition, so it was retained. Broadly, the Water Resources Committee has been engaged in information exchange, coordination, and data gathering related to assuring an adequate overall program in water resources research for national needs. Recent activity has been directed to analysis of research needs for flood problems. It issues an annual report on Federal water resources research programs, as required by the Water Resources Research Act.

NEW COMMITTEES

No new committees were established in 1973, but the establishment of two were discussed, namely, for materials and international geodynamics. Thees two, and two others were established in 1974, and three additional ones and a task force were established in 1975. The following new committees were established in this period:

1974:

Committee on Materials,

Ad Hoc Committee on the International Geodynamics Project.

Ad Hoc Committee on Domestic Technology Transfer,

Interagency Coordinating Committee for Astronomy.

1975:

Operating Committee,

Ad Hoc Committee on Social Research and Development.

Committee on Food Research,

Interagency Task Force on Inadvertent Modification of the Stratosphere (IMOS).

A brief description of each new interagency committee and of the IMOS task force is given below:

The *Committee on Materials* was established to identify key areas where Federal materials research and development need emphasis. The Committee is concerned with the total materials cycle—from the origin of resources, both renewable and non-renewable, through in-

corporation into materials for use in the economy and finally to their disposal. In establishing the Committee, the Council called attention to the need to address materials issues related to the national energy program, while at the same time recognizing environmental, health and safety factors.

The *Ad Hoc Committee on International Geodynamics Project* (IGP) was established to provide a focal point for the planning and coordination of Federal activities in the International Geodynamics Project as well as liaison with the U.S. Geodynamics Committee of the National Academy of Sciences and other organizations concerned with the Project. The IGP is an international program of research on plate tectonic theory and driving forces within the solid earth to increase knowledge of mountain formation, earthquakes, volcanoes, and the formation and location of petroleum and ore deposits.

The *Ad Hoc Committee on Domestic Technology Transfer* was established to improve coordination and information exchange among Federal agencies in promoting domestic technology transfer. In June 1975 it published an extensive directory of programs, resources, and contact points for Federal technology transfer.⁵ A Subcommittee on Models and Criteria has been engaged in a follow-on study to identify factors which are important for successful transfer and utilization of technology.

The *Ad Hoc Interagency Coordinating Committee for Astronomy* was established to improve the coordination of ground- and space-based astronomy programs, and to consider Federal long-range planning for astronomy, new astronomy technology, data handling and computational facilities, and use of balloons and rockets.

The *Operating Committee*, established in 1975 to assist the Executive Secretary and Council members in preparing for meetings, has already been discussed above.

An *Ad Hoc Committee on Social Research and Development* was established for a two-year period, with continuation subject to review, to survey and analyze Federal social research and development programs, to consider social R&D priorities, and processes and procedures for planning, managing, accounting and utilizing social research and development in the solution of pressing social problems.

Establishment of a *Committee on Food Research* was approved late in 1975. Its purpose is to review Federal food research programs and budgets, and to promote planning and coordination of food research within the Federal Government and between Federal agencies and other public and private research organizations.

A *Federal Interagency Task Force on Inadvertent Modification of the Stratosphere* (IMOS) was created jointly by the Federal Council for Science and Technology and the Council on Environmental Quality in January 1975. This ad hoc group was established to study potential sources of stratospheric modifications from human activities.

The Task Force completed its initial study on the fluorocarbon-ozone question in June 1975,⁹ concluding that there was "cause for

⁵ U.S. Federal Council for Science and Technology. Federal Technology Transfer Directory of Programs, Resources, Contact Points. Washington, U.S. Government Printing Office, 1975, 202 pages.

⁹ Council on Environmental Quality and Federal Council for Science and Technology. Federal Task Force on Inadvertent Modification of the Stratosphere (IMOS). Fluorocarbons and the Environment. Washington, U.S. Government Printing Office, June 1975. 109 p.

concern" that certain fluorocarbons, used as aerosol propellants and refrigerants, are not destroyed when released to the atmosphere, but can diffuse into the stratosphere and be decomposed by ultraviolet radiation. Released chlorine atoms may then react catalytically to decrease the ozone concentration. Among its conclusions and recommendations the IMOS report advised restricted use of fluorocarbons -11 and -12.

Following publication of the IMOS report on fluorocarbons and the environment, the Department of Commerce completed a preliminary analysis of possible impacts on the U.S. economy resulting from restricted use of fluorocarbons.¹⁰

In December 1975 the IMOS established a Subcommittee on Biological and Climatic Effects Research. The Subcommittee prepared a draft report in February 1976, presenting a preliminary proposed Federal research program to determine the biological and climatic effects of ozone reduction.¹¹ The report was a working paper for further program development by agencies and for funding discussions with OMB and congressional committees. The recommended program summarized funding requirements and agency capabilities for the various program elements for both the short term (fiscal year 1976-fiscal year 1977) and the long term (fiscal year 1976-fiscal year 1981).

The Federal Council reviewed the Subcommittee recommendations at two special meetings in February 1976. Agencies were requested to determine how much of planned fiscal year 1976 and fiscal year 1977 budget allocations could be re-programmed to carry out elements of the proposed program, and the IMOS Co-Chairmen and the Subcommittee Chairman were asked to meet with OMB agency budget examiners to determine how the remainder of the research might be financed.¹² The Council also designated the Environmental Protection Agency (EPA) as lead agency for the short-term program and asked EPA to prepare a report on progress in developing such a research program following discussions with OMB and congressional committees and further refinement of the program. Revision and detailed expansion of the short-term research program are currently underway; however, the long-term program has not been developed beyond the description in the draft report.

The IMOS released another report in March 1976, prepared by the Interdepartmental Committee for Atmospheric Sciences (ICAS), that assessed the possible effects on the stratosphere of man-made modifiers other than fluorocarbons.¹³ The report considered six classes of possible hazards: nitrogen fertilizers, brominated compounds, other chlorinated compounds, particles, the space shuttle, and carbon monoxide. It concluded that for each case no immediate serious problem was

¹⁰ Council on Environmental Quality and Federal Council for Science and Technology. Interagency Task Force on Inadvertent Modification of the Stratosphere. Further Information on the Fluorocarbon Industry and on Potential Economic Impacts of Restriction of Fluorocarbon Production. (Prepared by the Department of Commerce, Domestic and International Business Administration and Bureau of Domestic Commerce.) No publication date. 12 p.

¹¹ Federal Council for Science and Technology. IMOS Subcommittee on Biological and Climatic Effects Research. A Proposed Federal Research Program to Determine the Biological and Climatic Effects of Stratospheric Ozone Reduction. February 1976 (Draft). 93 p.

¹² *Ibid.*, pp. 24-25.

¹³ Council on Environmental Quality and Federal Council for Science and Technology. Interagency Task Force on Inadvertent Modification of the Stratosphere. Report by the Interdepartmental Committee for Atmospheric Sciences (ICAS): Potential Hazards to the Stratosphere Posed by Substances Other than Fluorocarbons. March 1976. 11 p.

apparent, owing to either highly speculative concern or to insufficiency of quantities of released compounds to produce hazardous effects.

REPORTS AND RECOMMENDATIONS OF OTHER FEDERAL COUNCIL COMMITTEES

Other continuing committees in the Federal Council system not mentioned above include:

The *Interdepartmental Committee for Atmospheric Sciences* (ICAS), established in 1959. A detailed case history of this committee over its entire 17-year existence is found in Appendix L, including its establishment and purpose, membership, panels and subcommittees, coordination with other committees, and review of activities, with a complete list of all reports published.

The *Interagency Committee on Marine Science and Engineering* (ICMSE), was established in 1971. This is the most recent in a series of coordinating committees for marine science and oceanography which date back to the Interagency Committee on Oceanography, an earlier Federal Council committee established in 1959. This latter committee was abolished in 1967 when its coordinating functions were assumed by the National Council on Marine Resources and Engineering Development, established by P.L. 89-454. When it discontinued operations in 1971, the Interagency Committee on Marine Science and Engineering was established. Case histories of both ICMSE and its earlier Federal Council predecessor, the Interagency Committee on Oceanography, are found in Appendices M and N. They contain information under the same headings detailed for the case history of the Interdepartmental Committee for Atmospheric Sciences, above.

The *Interagency Committee on Excavation Technology* (ICET) was established in 1971. Its stated objective is "to coordinate and optimize the Federal programs in research and technology in excavation, and to assist in guiding federal investments in this area."¹⁴ Because the expenditures for tunneling and other excavation in the United States over the next two decades are estimated to be more than \$300 billion, the development of improved technology offers considerable potential benefit, and this was the reason ICET was established. ICET is the focal point for the Federal effort in the U.S. National Committee on Tunneling Technology under the National Academy of Sciences/National Academy of Engineering which is participating in international cooperative effort in this field. Member agencies of ICET provide the financial support for the U.S. National Committee, and the National Science Foundation contracts with the NAS/NAE for operation of the Committee, which is also a member of the International Tunneling Association.

The *Interagency Arctic Research Coordinating Committee* (IARCC) was established in 1968 to perform a variety of functions associated with the coordination and planning of Arctic research by the 13 Federal agencies which support most of this research. The National Science Foundation is the lead agency for this activity and provides the technical and administrative support to IARCC. Federal and international Arctic research are discussed in the quarterly publi-

¹⁴ U.S. Federal Council for Science and Technology. Federal Excavation Technology Program, 1972-73 Report. Washington, U.S. Government Printing Office, 1973, 30 p. NSF 75-400. p. 1.

cation, *Arctic Bulletin*, published by the NSF. One issue each year contains the annual report of IARCC.

The two remaining Federal Council committees are the Committee on Federal Laboratories (COFL) and the Committee on Government Patent Policy.

The *Committee on Federal Laboratories* has since 1967 been the standing committee of the Federal Council whose establishment was directed by Executive Order 10807 of 1959. It was formerly designated the Standing Committee. Its focus is improving the operating effectiveness and management of Federal laboratories, both in-house and those operated on contract. The range of its activities is indicated by the titles of the reports it has issued over the years. (See Reports of the Federal Council for Science and Technology and Its Committees, Appendix I, below.) Federal Council consideration of its recommendations in the 1973-76 period are treated below (See: More effective utilization of Federal laboratories).

The *Committee on Government Patent Policy* was established in December 1965 to study the principles established by the Presidential Memorandum and Statement of Government Patent Policy of October 10, 1963, and to evaluate their effect on the public interest. This assignment included review of the underlying principles of the Policy, identification of policy issues relating to government patent policy, contributing to better understanding of these issues, and analyzing the probable effects of alternative policies.¹⁵ A revised Memorandum and Statement of Government Patent Policy was issued on August 23, 1971. It directs the Federal Council to make a continued effort to record, monitor and evaluate the effects of the Statement and specifies that the Committee on Government Patent Policy shall assist the Council in these matters. In addition to this major activity, the Committee has been instrumental in developing patent policy guidelines applicable to international cooperative agreements, and in preparing reports defining the position of the Executive Branch on patent policy. The Committee summarizes its activities in an annual report on Government Patent Policy. Federal Council consideration of recent matters relating to Government patent policy is also discussed below. (See: Government Patent Policy.)

EVOLUTION OF FEDERAL COUNCIL COMMITTEES, 1959-76

Table 6 presents a composite list of all Federal Council committees, panels, and groups, etc. which have been established within the 1959-76 period. It is a continuation of similar charts presented earlier in this report. It is possible to "stop the camera" at any year and by blocking out subsequent years, get a picture of the evolution of Federal Council committees up to that point.

Table 7 shows which departments and agencies are members or observers of the current Federal Council committees and the Task Force on Inadvertent Modification of the Stratosphere. It is also possible to see at a glance what representation each department or agency has on all Federal Council interagency committees.

¹⁵ Activities of the Federal Council for Science and Technology; Report for 1965 and 1966. op. cit. p. 26.

TABLE 6

FEDERAL COUNCIL COMMITTEES AND PANELS, GROUPS, ETC.	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
1959-1976																		
Standing Committee (From 1967— Committee on Federal Laboratories)	E	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Technical Committee on High Energy Physics	E	*	*	*	*	*	*	*	*	A 7/								
International Committee	E	*	*	*	*	*	*	*	*						12/			
Coordinating Committee on Materials Research & Development	E	*	*	*	*	*	*	*	*	A 7/								
Interdepartmental Committee for Atmospheric Sciences	E	*	*	*	*	*	*	*	*									C
Interagency Committee on Cosmography	E	*	*	*	*	*	*	*	A									
Committee on Long-Range Planning		E	*	*	*	*	*	*		A 7/								
Committee on Natural Resources		E	*	*	*	*	A											
Subcommittee on Water Resources Research		E	1/															
Committee on Water Resources Research		E	*	*	*	*	*	*	*									C
Committee on Scientific Information			E	*	*	K 2/												
Committee on Scientific Personnel			E	*	*	*	A 2/											
Ad Hoc Panel on Transportation Research				E	A 4/													
Patent Advisory Panel				E	*	*	*	*	*	K 2/								
Committee on Behavioral Sciences				E	*	*	*	*	*	A 7/								
Committee on Scientific and Technical Information					E	*	*	*	*						R 10/			
Committee on Government Patent Policy							E	*	*	*	*	*	*	*	*	*	*	C
Committee on Academic Science and Engineering							E	*	*	*	*	*	*	*	111/			
Ad Hoc Working Group on Solid Earth Sciences							E	M 5/										
Committee on Solid Earth Sciences								E	*	A 7/								
Committee on Environmental Quality								E	*	*	A							
Ad Hoc Interagency Working Group for Earthquake Research										M 6/								
Interagency Upper Mantle Committee										M 6/								
Interagency Arctic Research Coordinating Committee										E	*	*	*	*	*	*	*	C
Ad Hoc Group on Population Research										E	A 12/							
FCSP Study Group on DCD-Domestic Agency Review											12/							
Ad Hoc Committee on Intergovern- mental Science Relations											E	*	*	*	A			

TABLE 6—Continued

	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Ad Hoc Committee on R&D in relation to Environmental Quality...												E11/113/						
Interagency Committee on Marine Science and Engineering												E	****	*****				C
Committee on RAMN Coordination												E	****	T10/				
Interagency Committee on Excavation Technology												E	****	*****				C
Ad Hoc Committee on Ecological Research (Joint FGST-CEQ)												E	*****	A				
Committee on International Transfer of Technology												E	*****	T14/				
Committee on Energy Research and Development Goals												E	****	A				
Automation Opportunities in the Service Sector												E	*****	*****	T15/			
Committee on Forecasting Models													E	****	A			
Ad Hoc Committee on Domestic Technology Transfer																E	****	C
Ad Hoc Committee on the International Geodynamics Project																E	****	C
Interagency Coordinating Committee for Astronomy																E	****	C
Committee on Materials																E	****	C
Interagency Task Force on Inadvert. Modific. of Stratosphere																	E**	C
FGST Operating Committee																	E**	C
Ad Hoc Committee on Social Research and Development																	E**	C
Committee on Food Research																	E**	C

Legend: E = Established
 C = Continuing
 M = Merged
 A = Abolished
 T = Transferred

- 1/ Merged into a new Committee on Water Resources Research
- 2/ Merged into a broadened new Committee on Scientific and Technical Information
- 3/ Functions taken over by Standing Committee
- 4/ Abolished when Department of Commerce assumed direct responsibility for this field
- 5/ Merged into Committee on Solid Earth Sciences
- 6/ Became subordinate groups of Committee on Solid Earth Sciences
- 7/ Abolished June 1969
- 8/ Transferred to Department of State, June 1973
- 9/ Merged into reorganized Committee on Government Patent Policy
- 10/ Transferred to National Science Foundation, June 1973
- 11/ Became inactive January 1, 1972
- 12/ Discontinued upon completion of its work
- 13/ Established 1970; to be disestablished upon publication of report in 1971
- 14/ Transferred to Department of State
- 15/ Inactive following publication of report.

SELECTED FEDERAL COUNCIL ACTIVITIES

MORE EFFECTIVE UTILIZATION OF FEDERAL LABORATORIES

The subject of Federal laboratory utilization appears again and again during the record of Federal Council activity of the 1973-76 period. Both the subject and the Committee on Federal Laboratories (COFL) were examined and certain changes were recommended.

Recommendations and decisions concerning the COFL, as a result of the initial committee review conducted by Dr. Stever in the spring of 1973, included the following: (1) That the chairman of this committee be appointed. Until then, the chairman had traditionally been the Director of the National Bureau of Standards. (2) Provide for closer interaction between COFL and the Government Patent Policy Committee. Like bread and butter, the subject matter of each is complementary to the other. (3) Assign to this committee responsibility to make a comprehensive study on utilization of excess laboratory facilities for other national needs. (4) Provide NSF staff to support these studies.

Federal laboratory utilization was a topic on the agenda of each plenary session of the Federal Council in 1973, 1974 and 1975 except for the December meeting.

Probably in response to an OMB suggestion that the COFL should be given specific assignments relating to problems in the operations of Federal laboratories, a Task Force on Intergovernmental Use of Federal R&D Laboratories was established in August 1973 to focus on how Federal laboratories can be utilized by government bodies beyond their sponsors. The report of the Task Force was endorsed by the Federal Council at the April 1974 plenary session. This fact was noted by the Chairman of the Federal Council in a Foreword to the Committee's report of March 1974, "Intergovernmental Use of Federal R&D Laboratories." (Washington, U.S. Government Printing Office, 1974, 30 p. Issued September 1974 as NSF 74-401 by the National Science Foundation). The report contained suggested guidelines for undertaking intergovernmental work and a draft of a January 1974 Policy for Expanded Interagency Cooperation in the Use of Federal Laboratories. Although the Federal Council endorsed the COFL report, Dr. Stever's foreword was careful to note that "it does not constitute a formal statement of agency policy on Federal laboratory utilization."

It is understood that efforts have been underway since 1972 to promulgate a revised policy for expanded interagency cooperation in Federal laboratory utilization. The problem is reported to have been a negative reaction by the Office of Management and Budget.

Another illustration of how a committee can serve the Council is the Council's use of the COFL to review possible alternatives for a Federal Laboratory Information System in order to prepare a position for the President's Science Advisor who along with the General Services Administration and the Office of Management and Budget was requested to develop a method to better coordinate the requirements of Federal laboratories. This request was made by a House Appropriations Subcommittee on Agriculture-Environmental and Consumer Protection, based on the findings of an investigative report on "Utili-

zation of Federal Laboratories.”¹⁶ A Task Force of the COFL which was assigned this review, made a report to Dr. Stever late in 1974. Subsequently the COFL also reviewed and commented on a proposal developed by GSA for a proposed system for identifying and monitoring vacant and underutilized Federal laboratory space.

The matter was discussed at the House appropriation hearings on the NSF for FY 1976 in late February 1975. Dr. Stever said the approach to the problem was to “use the GSA public buildings system, which is a computer-based system, to refer all laboratory requests and to take a running inventory of the Federal laboratory space so that we in fact have a system built into the budget process which will preclude the kind of overlapping in construction which Congressman Whitten is concerned about.”¹⁷

The Federal Council subsequently considered the recommendation of the COFL Chairman on this matter. No further action has been taken.

GOVERNMENT PATENT POLICY

It is understood that during the review of all Federal Council inter-agency committees in the spring of 1973, a suggestion was made that the Committee on Government Patent Policy (CGPP) be taken out of the Federal Council and transferred to the GSA at a later date. However, it was the consensus of the Council that this committee should remain under it.

An initial assignment of Dr. Stever to Dr. Betsy Ancker-Johnson, Chairman of the CGPP, was to work with the Committee in developing patent policy guidelines applicable to international agreements, such as the U.S.-U.S.S.R. agreements then being developed.

Dr. Ancker-Johnson reported the progress on developing these guidelines and related patent policy matters at the first plenary session in 1974. Instead of a single guideline to cover all agreements, the Executive Subcommittee of CGPP working on this assignment recommended development of a checklist similar to the one developed by NATO for use by the Council and Intellectual Property Working Groups in drafting agreements to facilitate technology exchange.

Other topics considered by the CGPP in its report to the Federal Council included:

Definition of Executive Branch position on recommendations in the report of the Commission on Government Procurement relating to patent and data policy;

Developments in the suit filed by Public Citizen, Inc., affiliated with Ralph Nader, contending that licensing regulations (prepared by the CGPP) and revised and circulated by GSA following the issuance of the August 23, 1971 Presidential Statement on Government Patent Policy are unconstitutional;

Discussion of the implications of the Cramton Memorandum which stated the opinion that current patent policies may be unconstitutional;

¹⁶ U.S. Congress. House. Committee on Appropriations, Agriculture—Environmental, and Consumer Protection Appropriations for 1975. Hearings before a subcommittee of the . . . 93rd Congress 2d session. Part 7. Investigative report on “Utilization of Federal Laboratories.” Washington, U.S. Government Printing Office, 1974, 1204 p.

¹⁷ Department of Housing and Urban Development—Independent Agencies Appropriations for 1976. Hearings . . . 94th Congress 1st session, p. 113.

Discussion of a Department of Commerce proposed experimental program to try to determine the value of a licensing program of inventions owned by the Government which would have the objectives of enhancing transfer of technology; and

Patent rights provisions in pending energy bills.

The Executive Subcommittee of CGPP has approved reports of its Ad Hoc Subcommittees on Background Patent Rights and University Patent Policy, the former concerned with the policy relating to contractors' background patent rights to be acquired by agencies, the latter relating to the policy for assigning rights to inventions as a result of grants and contracts with nonprofit and educational institutions.

Dr. Betsy Ancker-Johnson discussed the need for a uniform Government patent policy with Chairman Ray Thornton (Dem., Ark.) during the 1975 hearings on the report of the Federal R. & D. program.¹⁸ She noted that there are presently at least 17 different policies regarding Government-held patents, or regarding the question of Government rights to patents. This diversity makes it very difficult for the public to deal with the Government on the matter of intellectual property. Dr. Ancker-Johnson told the subcommittee that the Government Patent Policy Committee was engaged in drafting a uniform patent policy covering patents for the entire Government.

STPO Director Dr. Russell Drew was queried concerning the need for a uniform patent policy at the above hearings.¹⁹ His response deferred to Dr. Ancker-Johnson.

In summary, the role of the Federal Council appears to have been one of receiving reports, and conducting a continuing dialog, but in recent years of having taken no definitive actions.

POLICY STATEMENTS OF THE FEDERAL COUNCIL

One measure of the effectiveness of an interagency coordinating body could be its record of achieving agreement on courses of action in specific situations or on specific topics. The extent of agreement can be measured by the number of policy statements which set forth future actions in certain situations. During the period of the sixties when the Federal Council was issuing an annual report, occasionally one or sometimes even two policy statements might be referenced in the section listing reports for that year. From the small number of policy statements which have been made public over the years, one would have to conclude that the Federal Council has a dismal record on this score. Because of its position as an advisory body to the President over most of its life, much of what the Council has accomplished has never been made public. To what extent this is true of policy statements—that they exist but have not been made public—is not known.

Policy statements can be classified into several categories. Policies developed within the Federal Council or its committees which move upward through the Chairman to the President and are made public

¹⁸ U.S. Congress. House. Committee on Science and Technology. Subcommittee on Domestic and International Scientific Planning and Analysis. Annual Report on Federal Research and Development Program Fiscal Year 1976: Special Oversight Hearing. 94th Congress 1st session, June 4, 1975, p. 35.

¹⁹ Ibid, p. 21.

with Presidential endorsement as courses of action for all executive branch units are probably the most far-reaching. Examples of these are the Presidential Statements on Government Patent Policy of 1963 and 1971, the Memorandum to the heads of departments and agencies of September 13, 1965, on strengthening academic capability for science throughout the country, and the statement by the President of February 21, 1969, upon approving a policy for expanded use of Federal research facilities by university investigators.

A second category of policy statements are those, again originating either within committees and/or the Council, which are adopted by consensus of the member agencies and thus become the uniform policy for all Federal departments and agencies on the particular subject of the policy. Examples of these include the statement of the revised policy on payment of page charges of April 11, 1974, and policy guidance for international scientific exchange programs: guidelines for participating U.S. agencies of June 1968.

The designation of a lead agency arrived at through consensus of Federal Council members also represents a policy agreement on a particular subject. Examples of these include Council decisions to transfer certain committees to a particular agency, as was the case with the International Committee, the Committee on Scientific and Technical Information, and the RANN Coordination Committee in 1973.

Finally, agreed positions or guidelines may be adopted by the Federal Council for its operations or those of its committees. Examples of these guidelines are decisions regarding the number of meetings, that new committees shall be established on an ad hoc basis, or how new business shall receive Council consideration.

Appendix K is a collection of policy statements and guidelines emanating from the Federal Council and its committees. It will be noted that a variety of formats have been used to promulgate various policies, ranging from agency press releases, notifications in the Federal Register, memoranda to members by the Chairman, to Presidential statements.

On occasion a policy statement is revised and, on later printings, this is noted. It is understood, however, that the Council has no regular procedure for reviewing policy statements to determine which are still current, which may need revision, and which should be removed. The Council is aware of this problem and in 1975 directed its Operating Committee to look into the matter and make recommendations for the uniform classification and promulgation of policy statements.

REPORT ON FEDERAL R. & D. PROGRAM FISCAL YEAR 1976

The idea for a report on the Federal R. & D. program for fiscal year 1976¹⁹ was discussed at a Federal Council meeting in April 1974. STPO Director Drew explained at hearings on the report in June 1975 that the Federal Council undertook this task for a number of reasons:²⁰

To enable decisionmakers in the Congress and the public sector to see the overall Federal effort in perspective.

¹⁹ U.S. Federal Council for Science and Technology, Report on the Federal R. & D. Program, fiscal year 1976, Washington, U.S. Government Printing Office, 1975, 165 p.
²⁰ Annual Report on Federal Research and Development Program, fiscal year 1976: Special Oversight Hearing, op. cit., p. 8.

To expand on the annual special analysis prepared by the Office of Management and Budget to include information concerning the smaller but extremely important R. & D. activities of new agencies in dealing with emerging problem areas.

To indicate the rather broad range of activities of the Federal Council which cut across agency lines and focus on interagency matters in a number of areas.

The resulting report represented a collaborative effort between Federal Council members and their agencies, the Science and Technology Policy Office at the National Science Foundation, and the Office of Management and Budget. In discussing the report, Dr. Drew indicated several areas of the first report which might be improved if a decision was made to repeat the effort in another year.²¹ In addition to expanding the report and providing more interpretation, he mentioned the possibility of expanding the section providing information about the Federal Council and its committees to include objectives and achievements, making it an annual report on the Council as well as on the Federal R. & D. program. He also approved a suggestion that manpower reports might be included in the document.

Late in 1975 the Council agreed to a recommendation of the Chairman not to do a similar report on the fiscal year 1977 R. & D. program, but in its place to have prepared an activities report which would provide background information about the Council and its committees and would be available for use in 1976 by the anticipated Office of Science and Technology Policy. As of the end of June 1976, the report was still understood to be in preparation.

This account of Federal Council activities over the past three years while considerably more detailed than that presented for any other period in preceding sections of this report, nevertheless, is not a complete or exhaustive account, but rather touches on highlights of selected areas of concern.

²¹ *Ibid.*, p. 11.

VII. LEGISLATIVE HISTORY OF STATUTORY AUTHORITY FOR THE FEDERAL COORDINATING COUNCIL FOR SCIENCE, ENGINEERING, AND TECHNOLOGY

From its establishment in 1959 until the passage of the National Science and Technology Policy, Organization, and Priorities Act of 1976, the Federal Council for Science and Technology operated under the authority of Executive Order 10807 of March 13, 1959, as amended by Executive Order 11381 of November 8, 1967.

THE FEDERAL COUNCIL OPPOSED HAVING A STATUTORY BASE IN 1967

The question of statutory status for the Federal Council for Science and Technology has been raised periodically. One such instance occurred a decade ago. A Library of Congress report on the Office of Science and Technology in 1967 discussed the role of OST and of the Federal Council in the light of congressional criticism of OST for not asserting greater initiative.¹ The report noted that the Council even then was functioning more as an arm of OST than as a science adviser's committee which is what it was designated to be under the Executive Order which established it. Three related questions were posed:²

1. Should the legislative authority of OST be explicitly expanded to embrace functions now assigned to the Federal Council, especially regarding technology?

2. If so, how should this be done without violating authority of the operating agencies?

3. Should machinery of the Federal Council be made statutory as a science subcabinet of policy officials from major agencies employing science?

The Library of Congress report and the questions it raised were considered by the Federal Council for Science and Technology. The consensus of members' reactions to the suggestion that a statutory base might be needed was reported in the Council's annual report for 1967.³ The report noted that "the members of the Council agreed that the structure and authority of FCST are satisfactory, and that a legislative base for FCST is not only unnecessary but undesirable because FCST is an instrument devised for the President to use as he sees fit in the administration of the laws." It was also the consensus that, "Problems in making FCST more effective arise from administrative sources and not from the nature of its formal authority."

¹ U.S. Library of Congress. Legislative Reference Service. The Office of Science and Technology; A Report prepared by the Science Policy Research Division for the Military Operations Subcommittee of the House Committee on Government Operations, March 1967. Washington, U.S. Govt. Print. Off., 1967, 326 p. 90th Congress, 1st session. Committee print, pp. 20-22.

² *Ibid.*, p. 22.

³ U.S. Office of Science and Technology. Federal Council for Science and Technology; 1967 Annual Report. Washington, U.S. Govt. Print. Off., 1968, 43 p. Pp. 13-14.

AMENDMENT OF EXECUTIVE ORDER 10807

It may be that the self-examination of the Council by its members occasioned by the report on the Office of Science and Technology was in part responsible for the amendment of Executive Order 10807 by Executive Order 11381 of November 8, 1967, which expanded the membership of the Council to include the State Department as a member and the two new departments, Housing and Urban Development, and Transportation. This was the only amendment to the Federal Council's "charter" in its seventeen years of existence. On at least two other occasions (1971 and 1974) the Council considered amendment of its charter without resulting action. On the earlier occasion it considered adding another new agency, EPA, as a member; on the latter occasion, a somewhat more extensive amendment to provide for increased flexibility of membership and an improved statement of objectives was considered.

CONSIDERATION AND ACTIONS IN THE 93D CONGRESS

In the period of general unrest in the scientific community following the abolition of the science advisory units from the Executive Office of the President by Reorganization Plan No. 1 of 1973, a great deal of consideration was given to what kinds of organizational responses were needed. One such response was the proposal to establish a National Technology Resources Council in the Executive Office of the President.

NATIONAL TECHNOLOGY RESOURCES COUNCIL PROPOSED

This Council was proposed in S. 2495, the Technology Resources Survey and Applications Act, introduced September 27, 1973, by Mr. Magnuson, Mr. Moss, and Mr. Tunney. The bill was referred jointly to the Committee on Aeronautical and Space Sciences and the Committee on Commerce.

The proposed National Technology Resources Council would be composed of the Vice President, as Chairman, and heads of Cabinet members and agency heads most involved with problems involving the utilization of high technology. A main function of the Council would have been to prepare a technology resources survey which included an inventory of the Nation's scientific and technological resources, an inventory of critical problems which could be addressed by science and technology, and recommendations for programs to solve these problems.

The act proposed that the technological resources and capability of the National Aeronautics and Space Administration would be made available to the Council through expansion of already ongoing activities. In particular, an Office of Technology Applications would be established to provide assistance to the Council in the preparation of the survey.

In accompanying remarks, Senator Magnuson explained that the act "provides for the systematic application of unemployed technological resources to the Nation's technology oriented problems."⁴

⁴ Remarks on the floor of the Senate by Mr. Magnuson, Congressional Record (daily ed.), v. 119, September 27, 1973, pp. S17835-37.

S. 2495, as introduced, did not mention the Federal Council for Science and Technology, and the functions set forth for the National Technology Resources Council were much more extensive than those of the Federal Council. Nevertheless, similarities in structure, functions, and support arrangements of the Technology Resources Council were reminiscent of the comparable aspects of the Federal Council.

NATIONAL SCIENCE AND TECHNOLOGY RESOURCES COUNCIL PROPOSED

In the ensuing months, S. 2495 underwent modification. A revised draft of the bill dated January 18, 1974, formed the basis for two days of joint hearings by the Committee on Aeronautical and Space Sciences and the Committee on Commerce on March 11 and 21, 1974.⁵ This version of S. 2495 specified that the National Science and Technology Resources Council to be established in the Executive Office of the President shall be composed of:

(a) The members of the Federal Council for Science and Technology as established by Executive Order 10807 of March 13, 1959, and amended by Executive Order 11381 of November 8, 1967; and

(b) A representative designated by the National Governors Conference; a representative designated by the National Association of Counties; and a representative jointly designated by the National League of Cities and the United States Conference of Mayors who shall be voting ex-officio members of the Council.

In lieu of the technology resources survey, which the Council in the original version of S. 2495 had been directed to prepare, the Science and Technology Resources Council was directed to prepare an annual survey including both science and technology resources; to develop a program to identify scientific and technological resources, which could be, but were not presently utilized; to make recommendations to the President concerning the assignment of any critical domestic problem identified by the resource survey to the Office of Technology Applications of NASA or any more appropriate Federal agency; to review progress made on problems assigned to NASA or other Federal agency; and to report to Congress at least annually on its activities including recommendations for legislative action.

Dr. H. Guyford Stever, NSF Director and Science Adviser to the President, was the first witness at the March hearing. The thrust of his remarks was to support an effort to strengthen Federal science and technology coordination and planning analysis capabilities, and to favor the inclusion of State and local government representatives in the Council. He said he thought this could be "effectively accomplished" by augmenting membership of the present Federal Council for Science and Technology and its subgroups. In effect, he supported the concept but did not feel legislation was necessary to achieve it. Subsequent testimony brought out his belief that the objectives of the bill could be met by expanding the membership of the Federal Council and its subcommittees to include, where appropriate, representation from industry and labor as well as local government representation

⁵ U.S. Congress. Senate. Committee on Aeronautical and Space Sciences and Committee on Commerce. Technology Resources Survey and Applications Act. Joint hearings before the . . . 93d Congress, 2d session on S. 2495. Washington, U.S. Govt. Print. Off. 1974, 156 p.

in order to expand its national base. This could be done under Reorganization Plan No. 1 of 1973.

Dr. Stever expressed the Foundation's position that the survey responsibilities assigned to the proposed Science and Technology Resources Council "may be overly ambitious." He noted that experience had shown "it is more appropriate to focus surveys and studies on specific major problems within the wide range of possible applications of science and technology . . . In such surveys, ad hoc groups of FCST members and special study teams utilizing appropriate expert consultants can examine issues and report results of their findings relatively quickly. Further, these findings will be reported in relation to the specific policy issues that may at a given moment be of concern to the President, the agencies, the Congress and the public."⁶

Finally, on the third main aspect of the bill, the utilization of NASA as a primary problem-solving agency, Dr. Stever cautioned that all the mission agencies must continue to be responsible for problem solving within their subject areas.

During the ensuing colloquy Dr. Stever illustrated how the Federal Council and OST had reported on the energy problem as far back as 1966 but no action had been taken. He said, "What we really have to do is sensitize our society to listen to what some of our experts are saying." In closing remarks he spoke to the necessity for Congress to keep its "spotlight" on a problem.

Other witnesses had similar doubts. National Academy of Sciences President Philip Handler thought the Federal Council was a cumbersome body for the functions proposed and reminded the committee that the Federal Council had had difficulty in carrying out its "minimum interagency role for coordination of Government activities."⁷

William Carey, Vice President of Arthur D. Little Inc. objected to the bill saying, "In the first place, the upgrading of a feeble interagency committee like the FCST is questionable. FCST has its uses, but science and technology policymaking is beyond its reach. It can deal with the housekeeping chores of administration, but it has no record of clout or effectiveness to speak of, and no audience except its chairman who also wears two hats as the President's Science Adviser and head of NSF. . . . To ask this group for an annual report on scientific and technical resources, much less for policy recommendations, of significance, is to miscalculate its capabilities and its stature."⁸

Senator John V. Tunney subsequently reported the consensus. "There seems to be agreement among the witnesses this morning," he said, "that the upgrading of the Federal Council on Science and Technology into a Council such as is envisioned in the legislation before us would be a poor idea."⁹

COUNCIL ON SCIENCE AND TECHNOLOGY PROPOSED

The Senate Commerce and Aeronautical and Space Sciences committees held a further joint hearing on still another version of S. 2495, Amendment No. 17, on July 11, 1974.¹⁰ This version of the bill

⁶ Ibid, p. 30.

⁷ Ibid, p. 59.

⁸ Ibid, p. 104.

⁹ Ibid, p. 116.

¹⁰ U.S. Congress, Senate, Committee on Commerce and Committee on Aeronautical and Space Sciences, Science and Technology Applications Act of 1974. Joint hearings before the . . . 93d Congress, 2d session on S. 2495, Amendment No. 1537. July 11, 1974. Washington, U.S. Govt. Print. Off., 1974, 62 p.

assigned the functions formerly proposed for the National Science and Technology Resources Council to a new Council of Advisers on Science and Technology within the Executive Office of the President, composed of three members engaged full-time with necessary staff. The new Council would be more like the previous OST than a coordinating council.

The witnesses included four previous Presidential Science Advisers and former Federal Council Executive Secretary Dr. Edward Wenk. Only Dr. Wenk made more than a passing reference to the Federal Council. He did this in expressing his concern at the "meager" emphasis given in the bill to coordination. His brief discussion concluded with the need for legislative authority for the Federal Council, observing that "... Congress which has a long record of intent about exorcising the devils of waste and duplication, has never taken initiatives to underpin the FCST with legislative authority. This present legislation could be greatly strengthened by some modification toward that end."¹¹ Dr. Wenk's comments on coordination are excerpted below:

* * * * *

Adding horizontal warp to the woof of vertical government structure is a longstanding problem in public management. There are very few major national goals where achievement rests on the missions and underpinning of specialized research and development of a single agency.

Indeed, mobilizing all of the technological engines of Federal bureaucracy to focus on common social goals is one of the most bewildering enigmas of modern democratic government. The problem is how to gain a sense of unity and direction when the compartmented bureaucracy, created one step at a time, is constantly stressed by pluralistic goals of our society and outside clientele. Under such battlefield conditions, the fragmentation leads to ineffective management in achieving goals; worse, it can generate stalemate. The fundamental process for gaining coherence is coordination.

But few carrots and sticks are available to the President to foster coordination. Each agency is expected to advocate its functions in the face of impediments. The constellation of Federal agencies, however, may be thought of as multiprogram instruments that can be wired together in new ways to accomplish unprecedented requirements. Some of the most creative moves of the Marine Science Council arose from recognition of the potency of such cross-connections, rather than creation of new organizations.

Coordination becomes the proving ground of effective public administration. It is the sense of community, suppression of parochial interests to a common weal, the systemic rather than sectorial approach that ultimately tests the degree to which a public enterprise can fulfill its purpose. The Council [of Advisers on Science and Technology] cannot intervene between the President and Cabinet officers, but it should have a license to serve as more than an umpire in

¹¹ Ibid, pp. 53-54.

helping the President to adjudicate disputes, by constructively harmonizing relevant elements in a systems approach to public administration. In an environment of departmentalism, coordination must operate through consensus. In the context of commonly developed fact, techniques employ mediation and persuasion.

The Federal Council for Science and Technology was created by executive order in 1959 to serve these coordinating tasks. It has had a chequered career. Among other factors, the President's science advisor as its chairman has often been too busy or sparing of his energies in stubborn, time-consuming persuasion to make it work. And it has suffered by lacking statutory support. Paradoxically, the Congress which has a long record of intent about exorcising the devils of waste and duplication, has never taken initiatives to underpin the FCST with legislative authority. This present legislation could be greatly strengthened by some modification toward that end.

FEDERAL COORDINATING COMMITTEE FOR SCIENCE AND TECHNOLOGY PROPOSED

Following the July 1974 hearing, the evolution of S. 2495 continued. The Senate Commerce Committee met in Executive Session on July 31, 1974, and ordered S. 2495 reported, with an amendment in the nature of a substitute. Identical action was taken by the Committee on Aeronautical and Space Sciences at its Executive Session on September 18, 1974.¹²

S. 2495 as reported was similar to the previous version, Amendment No. 1537, which had been considered at the July hearings, in the following respects: It retained a statement of congressional findings concerning the need to utilize science and technology in resolving critical and emerging national problems. It also retained the section which provided for the establishment of a Council of Advisers on Science and Technology in the Executive Office of the President, and the section requiring the President to transmit an annual science and technology report to the Congress.

It differed from the previous version in these two respects: The bill no longer contained Title II which would have established an Office of Technology Application within NASA to provide support and assistance to the Council of Advisers in discharging its responsibilities. Finally, the reported version of S. 2495 contained a new section 5 providing for the establishment of a Federal Coordinating Committee for Science and Technology.

The text of section 5, Federal Coordinating Committee for Science and Technology, from S. 2495 as reported, is printed below.¹³ It is the basis for the present statutory authority for the Federal Coordinating Council for Science, Engineering, and Technology provided for by Title IV of the National Science and Technology Policy, Organization and Priorities Act of 1976. However, S. 2495 contained

¹² U.S. Congress. Senate. Committee on Commerce and Committee on Aeronautical and Space Sciences. Technology Resources Survey and Applications Act of 1974. Report of the . . . on S. 2495. Washington, U.S. Govt. Print. Off., 1974. 93d Congress, 2d session. S. Rept. 93-1155. 33 p. P. 4.

¹³ Ibid, pp. 17-18.

no provision to abolish the existing Federal Council for Science and Technology. In fact, the legislative history specifically stated that "The existing Federal Council for Science and Technology . . . is upgraded and strengthened by this bill."

FEDERAL COORDINATING COMMITTEE FOR SCIENCE AND TECHNOLOGY

SEC. 5. (a) There is hereby established the Federal Coordinating Committee for Science and Technology (hereinafter referred to as the Committee).

(b) The Committee shall be composed of the Chairman of the Council of Advisers on Science and Technology and one representative of each of the following: Department of Agriculture, Department of Commerce, Department of Defense, Department of Health, Education, and Welfare, Department of Housing and Urban Development, Department of the Interior, Department of State, Department of Transportation, Atomic Energy Commission, National Aeronautics and Space Administration, and National Science Foundation. Each such representative shall be an official of policy rank designated by the head of the Federal agency concerned.

(c) The Chairman of the Council of Advisers on Science and Technology shall serve as Chairman of the Committee. The Chairman may make provision for another member of the Council to act temporarily as Chairman of the Committee.

(d) The Chairman (1) may request the head of any Federal agency not named in subsection (b) of this section to designate a representative to participate in meetings or parts of meetings of the Committee concerned with matters of substantial interest to the agency, and (2) may invite other persons to attend meetings of the Committee.

(e) The Committee shall consider problems and developments in the fields of science and technology and related activities affecting more than one Federal agency, and shall recommend policies and other measures—

(1) to provide more effective planning and administration of Federal scientific and technological programs,

(2) to identify research needs including areas of research requiring additional emphasis,

(3) to achieve more effective utilization of the scientific and technological resources and facilities of Federal agencies, including the elimination of unnecessary duplication, and

(4) to further international cooperation in science and technology.

(f) The Committee shall perform such other related duties as shall be assigned, consonant with law, by the President or by the Chairman.

(g) For the purpose of effectuating this section, each Federal agency represented on the Committee shall furnish

necessary assistance to the Committee in consonance with section 214 of the Act of May 3, 1945, 59 Stat. 134 (31 U.S.C. 691). Such assistance may include—

(1) detailing employees to the Committee to perform such functions, consistent with the purposes of this section, as the Chairman may assign to them, and

(2) undertaking, upon request of the Chairman, such special studies for the Committee as come within the functions herein assigned to the Committee.

(h) For the purpose of conducting studies and making reports as directed by the Chairman, standing subcommittees and panels of the Committee may be established in consonance with the provisions of section 214 of the Act of May 3, 1945, 59 Stat. 134 (31 U.S.C. 691).

The Committee's justification and explanation for strengthening the then-existing Federal Council for Science and Technology were also included in its report, along with the section-by-section analysis of section 5 relating to the Federal Coordinating Committee for Science and Technology.¹⁴ Both are included below:

[NEEDS]

* * * * *

(4) *More effective coordination of existing Federal research and development efforts.*

The Federal Council on Science and Technology (FCST) was established by Executive Order in 1959 to coordinate the research and development efforts of Federal agencies. However, according to many observers, the potential effectiveness of FCST as a communication channel and coordinating body has never been fully realized.

Witnesses urged that FCST be strengthened in terms of its capabilities to do the job; and in its capability to communicate with the Congress and the executive branch agencies.

Science Magazine recently described FCST in the following manner, "In theory, the group is a meeting ground for the research heads of all the agencies. But for the last several years, agencies have preferred to fight their battles elsewhere, leaving FCST little meaningful work or authority."

[MEETING THE NEEDS]

* * * * *

(4) *S. 2495 strengthens the existing mechanisms for coordinating Federal research and development programs*

The existing Federal Council for Science and Technology, established by Executive Order in 1959 to coordinate the science and technology activities of Federal agencies, is upgraded and strengthened by this bill. The name is changed to the Federal Coordinating Committee for Science and Technology to avoid confusion with the new Council of

¹⁴ Ibid, pp. 6-7, 8-9, 11-12.

Advisors for Science and Technology. The Coordinating Committee is assigned the additional responsibility of assisting in the Council's preparation of certain aspects of the annual Report on Science and Technology. By giving the Federal Coordinating Committee the specific responsibility for contributing to the annual Science and Technology Report, the Committees feel that the effectiveness of FCST will be greatly enhanced.

[SECTION-BY-SECTION ANALYSIS]

*

*

*

*

*

SECTION 5—FEDERAL COORDINATING COMMITTEE FOR
SCIENCE AND TECHNOLOGY

Subsection (a) establishes the Federal Coordinating Committee for Science and Technology (FCST). This Committee replaces the Federal Council on Science and Technology which was established by Executive Order in 1959. The name is changed to avoid confusion with the new Council of Advisors on Science and Technology. The membership and the functions of FCST are similar to that of the Federal Council on Science and Technology.

Subsection (b) lists the membership of the Committee. It consists of the Chairman of the CAST and one representative from each of the Federal agencies having major research and development programs.

Subsection (c) provides for the Chairman of CAST to serve as Chairman of the FCST with the Chairman having the power to appoint another member of CAST to temporarily act as Chairman of the Committee. This arrangement continues the relationship which previously existed between Presidential Science Advisers and the Federal Council on Science and Technology.

Subsection (d) provides for the Chairman to request other individuals or representatives to attend meetings of the Committee. It is important that FCST will be able to keep abreast of significant science and technology programs by calling upon persons who are not officially designated as members of FCST.

Subsection (e) provides for the Committee to consider science or technology matters which affect more than one Federal agency. The Committee is to make recommendations which provide for more effective planning, coordination, and utilization of Federal activities in science and technology, and to further international cooperation in science and technology. This language is patterned after the language in President Eisenhower's executive order which established the Federal Council on Science and Technology in 1959.

Subsection (f) provides for the Committee to perform other duties as assigned by the President or by the Chairman. In some respects, FCST will serve as a resource to CAST, and the Chairman may call upon FCST to carry out special studies and projects for CAST.

Subsection (g) provides for those Federal agencies, which have membership on the Committee to furnish staff assistance to the Committee. Since a considerable portion of FCST activities will involve coordination of agency research and development efforts, it is important that the technical experts from participating agencies be involved in these activities.

Subsection (h) authorizes the Committee to establish subcommittees and panels. It is expected that much of the detailed work of the Committee will be handled by the subcommittees and panels, whose membership and staff resources may be drawn from outside the membership of FCST itself.

NATIONAL POLICY AND PRIORITIES FOR SCIENCE AND TECHNOLOGY ACT, 1974

During the second session of the 93d Congress, the Senate Committee on Labor and Public Welfare also considered legislation relevant to national science policy. In particular, the Special Subcommittee on the National Science Foundation which has been assigned responsibility for the annual authorization of the NSF was involved. In late summer of 1974 the Subcommittee received a report requested from the Library of Congress entitled "A Review of the Implementation of Reorganization Plan No. 1 of 1973 by the Director, National Science Foundation, 1973-1974."¹⁵

The report had been requested to provide supplementary background information prior to planned hearings on national policy and priorities for science and technology in the fall of 1974.

On October 8, 1974, the Special Subcommittee on the National Science Foundation held a hearing to consider three bills:

S. 32, the National Science Policy and Priorities Act of 1973; introduced January 4, 1973 by Mr. Kennedy and others; referred to Committee on Labor and Public Welfare;

S. 2495, the Science and Technology Applications Act of 1974; introduced Sept. 27, 1973 by Mr. Magnuson and others; reported Sept. 18, 1974, with amendments, for the Committee on Commerce and the Committee on Aeronautical and Space Sciences and referred to the Committee on Labor and Public Welfare; and

S. 1686, the Civilian Science and Technology Policy Act of 1973; introduced May 2, 1973 by Mr. Dominick; referred to the Committee on Labor and Public Welfare.

S. 2495 has been discussed above. S. 1686 had the objective of facilitating the application of science and technology to civilian needs at the State and local level through the establishment of an Inter-governmental Science and Technology Advisory Council within the National Science Foundation and a program of State science and technology grants to be administered by the Foundation.

¹⁵ Unpublished. 180 p. Typescript. Prepared by Science Policy Research Division, Congressional Research Service.

The report is mentioned in the report of the Committee on Labor and Public Welfare entitled "Legislative Review Activity", 94th Congress, 1st session. S. Rept. 94-87 which noted at page 84: "... both the Library of Congress report and the quarterly reports were utilized by the Subcommittee during hearings on science policy and on the National Science Foundation authorization for fiscal 1975."

S. 32 as introduced in the 93d Congress was identical to S. 32 which the Senate passed in the 92d Congress. Its focus was to provide additional legislative and funding authority to the National Science Foundation to establish a Civil Science Systems Administration to design and develop systems to provide improved public services in areas such as public safety, sanitation, housing, transportation, and health care delivery. Another title was concerned with assisting in the transition of scientific and technical manpower from research and engineering programs, where they are no longer needed, to other civilian-oriented research and engineering activities.

Just before the October 1974 hearings on S. 32 and other bills began, but not in time to be considered in prepared testimony, a considerably revised version of S. 32 was made available to the witnesses. Consequently, the hearings provided only limited utility in guiding the Subcommittee concerning the content of S. 32.

Dr. Stever's testimony concerning the proposals in S. 2495 to establish a Council of Advisers on Science and Technology in the Executive Office of the President, to be assisted by the Federal Council for Science and Technology, under a new name, suggested something less than approval. Speaking of the proposed new bodies and the way they might operate, he noted, "In many ways this is a return to the earlier mode of science advice which did not take full advantage of the strengths of the mission agencies, including the NSF."¹⁶

At the time of this hearing, President Gerald Ford had been in office about two months. It will be recalled that the President's assignment to Nelson Rockefeller, following his confirmation as Vice President, to study the matter of science advice for the President and submit his recommendations was made in December 1974, two months hence. For this reason, Dr. Stever's reaction was properly noncommittal.

Another witness, Dr. Edward Wenk, speaking to the revised S. 32, expressed his opinion that the "translation of a Federal Council for Science and Technology to a statutory body, as you now have it in the bill, is the major step ahead."¹⁷

S. 32 reported and passed. On October 8, 1974, following the hearing, both the Subcommittee and the full Committee on Labor and Public Welfare considered the three bills, and that same day the committee ordered S. 32 reported with an amendment in the nature of a substitute and a title amendment.¹⁸

S. 32 as reported was an amalgamation of the three bills, with additional modification. It contained a statement of national science policy. Title I provided for the establishment of a Council of Advisers on Science and Technology within the Executive Office of the President, for the conduct of a study of Federal organization for science and technology by the National Academy of Sciences, and for the transmission of an annual science and technology report.

Title II provided for the establishment of a Federal Coordinating Committee for Science and Technology. The relevant provisions of

¹⁶ U.S. Congress. Senate. Committee on Labor and Public Welfare. National Policy and Priorities for Science and Technology Act, 1974. Hearing before the Special Subcommittee on the National Science Foundation of the . . . 93d Congress, 2d session on S. 32, Oct. 8, 1974. Washington, U.S. Govt. Print. Off., 1974. 700 p. (Note: The hearing record includes the text of S. Rept. 93-1155 on S. 2495 and S. Rept. 93-1254 on S. 32.).

¹⁷ *Ibid.* p. 239.

¹⁸ U.S. Congress. Senate. Committee on Labor and Public Welfare. National Policy and Priorities for Science and Technology Act of 1974. Report to accompany S. 32, Oct. 9, 1974. Washington, U.S. Govt. Print. Off., 1974. 26 p. 93d Congress, 2d session. S. Rept. 93-1254.

S. 32 differed from S. 2495 in these two respects: (1) S. 32 added the Veterans' Administration, Environmental Protection Agency, and Energy Research and Development Administration to the membership of the Federal Coordinating Committee; and (2) S. 32 abolished the Federal Council for Science and Technology.

The text of Title II from S. 32 follows:

TITLE II—FEDERAL COORDINATING COMMITTEE FOR SCIENCE AND TECHNOLOGY

ESTABLISHMENT AND FUNCTIONS OF FEDERAL COORDINATING COMMITTEE FOR SCIENCE AND TECHNOLOGY

SEC. 201. (a) There is established the Federal Coordinating Committee for Science and Technology (hereinafter referred to as the "Committee").

(b) The Committee shall be composed of the Chairman of the Council of Advisers on Science and Technology and one representative of each of the following: Department of Agriculture, Department of Commerce, Department of Defense, Department of Health, Education, and Welfare, Department of Housing and Urban Development, Department of the Interior, Department of State, Department of Transportation, Veterans Administration, Atomic Energy Commission, National Aeronautics and Space Administration, National Science Foundation, Environmental Protection Agency, and Energy Research and Development Agency. Each such representative shall be an official of policy rank designated by the head of the Federal agency concerned.

(c) The Chairman of the Council of Advisers on Science and Technology shall serve as Chairman of the Committee. The Chairman may make provision for another member of the Council, to act temporarily as Chairman of the Committee.

(d) The Chairman (1) may request the head of any Federal agency not named in subsection (b) of this section to designate a representative to participate in meetings or parts of meetings of the Committee concerned with matters of substantial interest to such agency, and (2) may invite other persons to attend meetings of the Committee.

(e) The Committee shall consider problems and developments in the fields of science and technology and related activities affecting more than one Federal agency, and shall recommend policies and other measures—

(1) to provide more effective planning and administration of Federal scientific and technological programs.

(2) to identify research needs including areas of research requiring additional emphasis,

(3) to achieve more effective utilization of the scientific and technological resources and facilities of Federal agencies, including the elimination of unnecessary duplication, and

(4) to further international cooperation in science and technology.

(f) The Committee shall perform such other related duties as shall be assigned, consonant with law, by the President or by the Chairman.

(g) For the purpose of effectuating this section, each Federal agency represented on the Committee shall furnish necessary assistance to the Committee in accordance with section 214 of the Act of May 3, 1945 (59 Stat. 134; 31 U.S.C. 691). Such assistance may include—

(1) detailing employees to the Committee to perform such functions, consistent with the purposes of this section, as the Chairman may assign to them, and

(2) undertaking, upon request of the Chairman, such special studies for the Committee as come within the functions herein assigned to the Committee.

(h) For the purpose of conducting studies and making reports as directed by the Chairman, standing subcommittees and panels of the Committee may be established in consonance with the provisions of section 214 of the Act of May 3, 1945 (59 Stat. 134; 31 U.S.C. 691).

ABOLITION OF FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

SEC. 201. The Federal Council for Science and Technology established pursuant to Executive Order 10807, dated March 13, 1959, as amended by Executive Order 11381, dated November 8, 1967, is abolished.

The brief explanation and sectional analysis of Title II are excerpted below:¹⁹

[EXPLANATION]

FEDERAL COORDINATING COMMITTEE FOR SCIENCE AND TECHNOLOGY

This Act redesignates the Federal Council for Science and Technology as the Federal Coordinating Committee for Science and Technology, and gives it the statutory authority to coordinate Federal plans and programs in science and technology. The Chairman of the Council is designated as Chairman of this Committee.

[SECTION-BY-SECTION ANALYSIS]

TITLE II—FEDERAL COORDINATING COMMITTEE FOR SCIENCE AND TECHNOLOGY

Section 201. This action establishes a Federal Coordinating Committee for Science and Technology and assigns the same functions to the Committee previously fulfilled by the Federal Council for Science and Technology.

Section 202. This section abolishes the Federal Council for Science and Technology.

Title III of S. 32 made certain amendments in the functions of the National Science Foundation and the National Science Board, pro-

¹⁹ *Ibid.*, pp. 16, 23.

vided for assistance in support of the Council, and directed the Foundation to initiate a program of continuing education in science and engineering. Title IV established an Intergovernmental Science and Technology Advisory Committee in the National Science Foundation and authorized the Foundation to make grants to States to pay part of the cost of establishing an Office of State Science and Technology.

The Senate passed S. 32 without amendment on October 11, 1974. It was referred to the House Committee on Science and Astronautics where it remained when the 93rd Congress adjourned.

Action in the House.—Beginning in 1973, the full Committee on Science and Astronautics assumed responsibility for continuing the studies of Federal policy, plans and organization for science and technology and national science policy which its Subcommittee on Science, Research, and Development had been conducting over the previous decade.

In the first of a series of annual hearings, the Committee in July 1973 explored the immediate effect of Reorganization Plan No. 1 of 1973 on the Director of the National Science Foundation.²⁰ Under the plan, Dr. Stever also assumed science advisory functions formerly provided to the President and units of the Executive Office of the President by the Science Adviser and Director of the Office of Science and Technology.

Further analysis and study of the situation were contained in an Interim Report in which a broad range of issues which needed further study²¹ was identified. The House Committee on Science and Astronautics held a second series of hearings in June and July 1974.²² Again the record was studied.

When it appeared in late 1974 that the new President might entertain some new arrangements for science advice, the Committee began to consider draft legislation.

SCIENCE POLICY LEGISLATION IN THE 94TH CONGRESS

ACTION IN THE HOUSE

On March 6, 1975, Chairman Olin E. Teague, House Committee on Science and Technology (formerly Science and Astronautics) and Mr. Mosher, ranking minority member, introduced H.R. 4461, the National Science Policy and Organization Act of 1975. The broad bill contained a statement of national science policy, provided for the establishment of a Council of Advisers on Science and Technology within the Executive Office of the President to perform functions similar to the previous Office of Science and Technology, established a Department of Research and Technology Operations to provide a centralized administrative resource to enumerated key Federal agencies whose primary mission is scientific or technical research

²⁰ U.S. Congress. House. Committee on Science and Astronautics. Federal Policy, Plans, and Organization for Science and Technology. Hearings before the . . . 93d Congress, 1st session. July 17, 19, 23-24, 1973. Washington, U.S. Govt. Print. Off., 1973. 180 p.

²¹ U.S. Congress. House. Committee on Science and Astronautics. Federal Policy, Plans, and Organization for Science and Technology. Interim Report . . . 93d Congress, 2d session. July 1974. Washington, U.S. Govt. Print. Off., 263 p. H. Rept. No. 93-1184.

²² U.S. Congress. House. Committee on Science and Astronautics. Federal Policy, Plans, and Organization for Science and Technology; Part II. Hearings . . . 93d Congress, 2d session. June 20, 25-27, July 9-11, 16, 18, 1974. 825 p.

and development, and a Science and Technology Information and Utilization Corporation to facilitate dissemination of scientific and technical information. No action was recommended in the legislation regarding the Federal Council for Science and Technology.

Hearings on the draft legislation were scheduled to be held in June 1975.

ADMINISTRATION DECIDES TO REESTABLISH SCIENCE ADVISORY OFFICE

An important development in the spring of 1975 was the announcement by the Administration that a decision had been made to establish an Office of Science and Technology Policy in the Executive Office of the President and that draft legislation was being sent to the Congress.²³ This action followed a study undertaken by the Vice President at the President's request on the need for such advice.

The Administration bill, H.R. 7830/S. 1987, proposed the establishment of an Office of Science and Technology Policy in the Executive Office of the President. The remainder of the bill contained organizational details relating to the office.

HOUSE HEARINGS ON LEGISLATIVE PROPOSALS AND PASSAGE OF H.R. 10230

In June 1975, the House Committee on Science and Technology²⁴ held the third in its series of hearings relating to Federal policy, plans and organization for science and technology. The beginning of the House hearings coincided with the publication of the Administration's draft legislation proposing the establishment of an Office of Science and Technology Policy. Testimony was received on H.R. 4461 and the administration bill H.R. 7830.

A preponderance of the witnesses were of the opinion that Congress should move ahead to enact legislation to establish a national science policy and provide for a science advisory office within the Executive Office of the President. However, both the proposals for the Department of Research and Technology Operations and the Science and Technology Information and Utilization Corporation, while favorably commented on, were believed to require further study. To insist upon incorporating them into legislation to establish a new science advisory office for the President might prejudice the whole bill, they argued.

The information received at the hearings and subsequent committee study led to the introduction of a revised National Science and Technology Policy and Organization Act of 1975 (H.R. 9058) on July 30, 1975. This bill, too, underwent further study, and on October 29, 1975, a clean bill, H.R. 10230, was reported.^{24a} H.R. 10230 passed the House, amended, on November 6, 1975, and was referred jointly to the Senate Committees on Aeronautical and Space Sciences, Commerce, and Labor and Public Welfare.

²³ U.S. White House, Press Conference of James M. Cannon, Assistant to the President for Domestic Affairs, Frank E. Moss, Senator from the State of Utah, and Olin E. Teague, Representative from the State of Texas, May 22, 1975.

²⁴ U.S. Congress, House, Committee on Science and Technology, National Science and Technology Policy, Organization, and Priorities Act of 1975. Hearings. . . June 10, 11, 17, 19, 23, 1975, 94th Congress, 1st session, Washington, U.S. Govt. Print. Off., 1975. 1041 p.

^{24a} U.S. Congress, House, Committee on Science and Technology, National Science and Technology Policy and Organization Act of 1975. Washington, U.S. Govt. Print. Off., 1975. 94th Congress 1st Sess. H. Rept. 94-595. 50 p.

H.R. 10230, as passed by the House, contained a comprehensive statement of national science and technology policy; established in the Executive Office of the President an Office of Science and Technology Policy to be headed by a Director appointed by the President with the advice and consent of the Senate, and up to four Assistant Directors; established a temporary Federal Science and Technology Survey Committee to conduct a broad survey of the overall context of the Federal science and technology effort including missions, goals, personnel, funding, organization, facilities, and activities in general; and amended the National Science Foundation Act of 1950 to eliminate the requirement for an annual report by the National Science Board. Administration spokesmen endorsed the bill and urged its early enactment.

From time to time during the House hearings in the 1973-1975 period, the subject of the Federal Council for Science and Technology had arisen, when related subjects were being discussed, but the matter of statutory authority for it did not arise. Consequently, H.R. 10230 which passed the House was silent on this matter.

SENATE ACTION ON S. 32 AND PASSAGE OF H.R. 10230 AMENDED

S. 32, the National Policy and Priorities for Science and Technology Act of 1975, was introduced January 15, 1975, by Mr. Kennedy and others. It was jointly referred to the Committees on Labor and Public Welfare, Commerce, and Aeronautical and Space Sciences.

As introduced, S. 32 was identical with the version of S. 32 which passed the Senate on October 11, 1974 in the 93rd Congress.

No action was taken in the Senate on S.32 and related bills until shortly before the House completed action on H.R. 10230. On October 28, November 4, and 12, 1975, the three Senate committees to which S. 32 had been referred held joint hearings on that bill and the Administration bill, S. 1987, and also on H.R. 10230, after passage.^{24b}

It will be recalled that Title II of S. 32 of the 93d Congress had provided for the establishment of a Federal Coordinating Committee for Science and Technology and that this title was also in S. 32 as introduced in 1975. Reactions of the witnesses to the provisions in S. 32 to create a Federal Coordinating Committee ranged from failure to say anything at all about it, as was the case with Dr. Stever, to expression of doubt whether the provisions might be more costly than beneficial. For example, Dr. Eugene Skolnikoff's comment was the most favorable of those who addressed this section. He said, "it seems to be generally useful to give the Federal Council for Science and Technology a statutory base, as provided in S. 32, though I would not expect thereby to see the new organization very much more prominent in a science policy role than the existing Council has been."²⁵

^{24b} U.S. Congress. Senate. Committee on Labor and Public Welfare, the Committee on Commerce, and the Committee on Aeronautical and Space Sciences. National Policy and Priorities for Science and Technology Act, 1975. Joint Hearings . . . 94th Congress, 1st Session on S. 32 . . . and related bills. Oct. 28, Nov. 4, 12, 1975. Washington, U.S. Govt. Print. Off., 1976. 498 p.

²⁵ Ibid, p. 100.

National Academy of Sciences President Philip Handler commented that "easy working relationships" between the Executive Office science and technology advisory mechanisms and the departments and agencies are important to achieving cooperation and coordination and said formal coordinating mechanisms had not been very successful. Continuing, he said: ²⁶

The Federal Council for Science and Technology, established by Executive Order in 1959, can serve as a useful forum for interagency consultation under the chairmanship of the President's science adviser. More direct and individualized approaches by the science adviser at the highest levels functioning with respect to specific problems and issues, are more likely to achieve the necessary degree of coordination. For this reason, I question the desirability of establishing a statutory Federal Coordinating Committee for Science and Technology as provided by Title II of S.32. Such a statutory mechanism would have not only the inherent weaknesses to which I have alluded, but its statutory character and functions might well hamper the science adviser's flexibility and freedom of action.

Roger Revelle, another witness, expressed doubt about the provisions for "reviving" the Federal Council for Science and Technology under the Council of Science Advisors because he thought this "would be likely to cost the Council [of Science Advisors] or Office more in time than it would gain in benefits." ²⁷

In the weeks following the hearings, extended discussions were held among members and staff of the three committees exercising jurisdiction. S.32 is known to have gone through at least six drafts before a version was prepared on which the three committees could agree. In separate sessions, each of the three committees met and agreed to report S.32, with an amendment in the nature of a substitute. The National Policy, Organization, and Priorities for Science, Engineering, and Technology Act of 1976 was officially reported February 3, 1976. ²⁸ On February 4, 1976, the Senate passed H.R. 10230 after amending it to contain the text of S.32. S.32 was indefinitely postponed.

Title IV in H.R. 10230 as passed by the Senate differed from the version in S.32 as introduced in these respects: The name of the organization was changed from Federal Coordinating Committee for Science and Technology to Federal Coordinating Group for Science, Engineering, and Technology. Two additional agencies were added to the membership: Nuclear Regulatory Commission, and National Oceanic and Atmospheric Administration. Finally, section 401(f) providing for the Group to perform other related duties as assigned by the President or the Chairman was clarified by the addition of the word "advisory" before "duties", to emphasize the advisory character of its activities.

²⁶ Ibid, p. 59.

²⁷ Ibid, p. 132.

²⁸ U.S. Congress, Senate, Committee on Labor and Public Welfare, the Committee on Commerce, and the Committee on Aeronautical and Space Sciences. National Policy, Organization, and Priorities for Science, Engineering, and Technology Act of 1976. Joint Report to Accompany S. 32. Feb. 3, 1976. Washington, U.S. Govt. Print. Off., 1976. 47 p. 94th Congress, 2d session. S. Rept. 94-622.

FEDERAL COORDINATING GROUP FOR SCIENCE, ENGINEERING, AND
TECHNOLOGY

The text of Title IV of S. 32, which was incorporated into H.R. 10230, and an excerpt from the section-by-section analysis in the Senate report follow:²⁹

TITLE IV—FEDERAL COORDINATING GROUP FOR
SCIENCE, ENGINEERING, AND TECHNOLOGY

ESTABLISHMENT AND FUNCTIONS

SEC. 401. (a) There is established the Federal Coordinating Group for Science, Engineering, and Technology (hereinafter referred to as the "Group").

(b) The Group shall be composed of the Director of the Office of Science, Engineering, and Technology Policy and one representative of each of the following Federal agencies: Department of Agriculture, Department of Commerce, Department of Defense, Department of Health, Education, and Welfare, Department of Housing and Urban Development, Department of the Interior, Department of State, Department of Transportation, Veterans' Administration, Nuclear Regulatory Commission, National Aeronautics and Space Administration, National Oceanic and Atmospheric Administration, National Science Foundation, Environmental Protection Agency, and Energy Research and Development Administration. Each such representative shall be an official of policy rank designated by the head of the Federal agency concerned.

(c) The Director of the Office of Science, Engineering, and Technology Policy shall serve as Chairman of the Group. The Chairman may make provision for another member of the Group to act temporarily in the Chairman's absence as Chairman of the Group.

(d) The Chairman may (1) request the head of any Federal agency not named in subsection (b) of this section to designate a representative to participate in meetings or parts of meetings of the Group concerned with matters of substantial interest to such agency, and (2) invite other persons to attend meetings of the Group.

(e) The Group shall consider problems and developments in the fields of science, engineering, and technology and related activities affecting more than one Federal agency, and shall recommend policies and other measures designed to—

(1) provide more effective planning and administration of Federal scientific, engineering, and technological programs,

(2) identify research needs including areas of research requiring additional emphasis,

²⁹ Ibid, pp. 13-14, 22-23.

(3) achieve more effective utilization of the scientific, engineering, and technological resources and facilities of Federal agencies, including the elimination of unnecessary duplication, and

(4) further international cooperation in science, engineering, and technology.

(f) The Group shall perform such other related advisory duties as shall be assigned by the President or by the Chairman.

(g) For the purpose of carrying out the provisions of this section, each Federal agency represented on the Group shall furnish necessary assistance to the Group. Such assistance may include—

(1) detailing employees to the Group to perform such functions, consistent with the purposes of this section, as the Chairman may assign to them, and

(2) undertaking, upon request of the Chairman, such special studies for the Group as come within the functions herein assigned to the Group.

(h) For the purpose of conducting studies and making reports as directed by the Chairman, standing subcommittees and panels of the Group may be established.

ABOLITION OF FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

SEC. 402. The Federal Council for Science and Technology, established pursuant to Executive Order 10807, issued March 13, 1959, as amended by Executive Order 11381, issued November 8, 1967, is hereby abolished.

[SECTION-BY-SECTION ANALYSIS]

ESTABLISHMENT AND FUNCTIONS

Section 401. This section establishes the Federal Coordinating Group for Science, Engineering, and Technology, to be chaired by the Director, and to exercise the same functions as those heretofore exercised by the Federal Council for Science and Technology. These functions are purely advisory in nature and involve no exercise of authority over the participating agencies, whose participation is governed by their applicable statutes.

ABOLITION OF FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Section 402. This section abolishes the Federal Council for Science and Technology, which had been established by Executive Order in 1959.

CONFERENCE REPORT ON H.R. 10230

The House disagreed to the Senate amendments to H.R. 10230 and requested a conference on February 25, 1976. The Senate agreed to a conference the following day.

The conference committee met on April 1. By that time through informal discussions between the staffs of the committees many of the differences had been resolved. Among them was a decision to include Title IV to establish a Federal Coordinating Council (rather than Group) for Science, Engineering, and Technology.

Another point of difference was in the interpretation of the term "science and technology," and whether it also included "engineering" without so stating. The House position was that "engineering" was included in "science and technology," while the Senate conferees maintained that "engineering" should be specifically stated. The Committee on Conference agreed that both "science and technology" and "science, engineering, and technology" would be used throughout the bill, where appropriate. Consequently, "engineering" was retained throughout Title IV because this title "deals with all Federal research and development activities on a government-wide basis."³⁰ The conference report was agreed to in the Senate on April 26, and in the House on April 29, 1976, thereby clearing the bill for the President, who signed it on May 11, 1976 (Public Law 94-282).

FEDERAL COORDINATING COUNCIL FOR SCIENCE, ENGINEERING, AND TECHNOLOGY

The text of Title IV, as passed, appears below:

TITLE IV—FEDERAL COORDINATING COUNCIL FOR SCIENCE, ENGINEERING, AND TECHNOLOGY

ESTABLISHMENT AND FUNCTIONS

SEC. 401. (a) There is established the Federal Coordinating Council for Science, Engineering, and Technology (hereinafter referred to as the "Council").

(b) The Council shall be composed of the Director of the Office of Science and Technology Policy and one representative of each of the following Federal agencies: Department of Agriculture, Department of Commerce, Department of Defense, Department of Health, Education, and Welfare, Department of Housing and Urban Development, Department of the Interior, Department of State, Department of Transportation, Veterans' Administration, National Aeronautics and Space Administration, National Science Foundation, Environmental Protection Agency, and Energy Research and Development Administration. Each such representative shall be an official of policy rank designated by the head of the Federal agency concerned.

(c) The Director of the Office of Science and Technology Policy shall serve as Chairman of the Council. The Chairman may designate another member of the Council to act temporarily in the Chairman's absence as Chairman.

(d) The Chairman may (1) request the head of any Federal agency not named in subsection (b) of this section to desig-

³⁰ U.S. Congress. Committee of Conference. Science and Technology Policy. Conference Report to Accompany H.R. 10230. April 26, 1976. Washington, U.S. Govt. Print. Off., 1976. 21 p. 94th Congress, 2d session. H. Rept. 94-1046; S. Rept. 94-765. P. 21.

nate a representative to participate in meetings or parts of meetings of the Council concerned with matters of substantial interest to such agency, and (2) invite other persons to attend meetings of the Council.

(e) The Council shall consider problems and developments in the fields of science, engineering, and technology and related activities affecting more than one Federal agency, and shall recommend policies and other measures designed to—

(1) provide more effective planning and administration of Federal scientific, engineering, and technological programs.

(2) identify research needs including areas requiring additional emphasis.

(3) achieve more effective utilization of the scientific, engineering, and technological resources and facilities of Federal agencies, including the elimination of unwarranted duplication, and

(4) further international cooperation in science, engineering, and technology.

(f) The Council shall perform such other related advisory duties as shall be assigned by the President or by the Chairman.

(g) For the purpose of carrying out the provisions of this section, each Federal agency represented on the Council shall furnish necessary assistance to the Council. Such assistance may include—

(1) detailing employees to the Council to perform such functions, consistent with the purposes of this section, as the Chairman may assign to them, and

(2) undertaking, upon request of the Chairman, such special studies for the Council as come within the functions herein assigned.

(h) For the purpose of conducting studies and making reports as directed by the Chairman, standing subcommittees and panels of the Council may be established.

ABOLITION OF FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

SEC. 402. The Federal Council for Science and Technology, established pursuant to Executive Order 10807, issued March 13, 1959, as amended by Executive Order 11381, issued November 8, 1967, is hereby abolished.

Also included is the discussion of Title IV from the Joint Explanatory Statement of the Committee of Conference:³¹

TITLE IV—FEDERAL COORDINATING COUNCIL FOR SCIENCE, ENGINEERING AND TECHNOLOGY

This title was not in the House bill but was added by the Senate amendment.

³¹ Ibid, p. 19.

The effect of this title is to make the existing Federal Council for Science and Technology, set up by Executive Order in 1959, a statutory body with the Director of the new Office as chairman. The current Council is an interdepartmental group representing all Federal agencies with significant research and development missions, whose function is to maintain general liaison of the overall government effort in science and technology. The title adds no new functions. It does change the name of the present Council, emphasizes its mission, and places it on a statutory basis. In interpreting this title, reference should be made to the following statement from the Senate Report (94-622): "These functions are purely advisory in nature and involve no exercise of authority over the participating agencies, whose participation is governed by their applicable statutes." Managers on the part of the House agreed to accept this title.

Earlier versions of this title, in S. 2495 and S. 32, had defined the coordinating body as a Committee, then a Group. In deciding to call it the Federal Coordinating Council for Science, Engineering and Technology, the conference committee settled on a name much like the predecessor Federal Council for Science and Technology.

COMPARISON OF TITLE IV OF P.L. 94-282 WITH EXECUTIVE ORDER 10807
OF 1959, AS AMENDED

Title IV of Public Law 94-282 is essentially an amended version of Executive Order 10807 of March 13, 1959, which established the Federal Council for Science and Technology, and which was amended only once by Executive Order 11381 of November 8, 1967. The similarities (and differences) can most readily be seen on the following annotated copy of Executive Order 10807 in the original form which accompanied the White House press statement on its signing by President Dwight D. Eisenhower on March 13, 1959.³²

³² As has been noted previously, changes in Executive Order 10807 made by Executive Order 11381 consisted of the addition of two new departments, Housing and Urban Development, and Transportation, as members, and the elevation of the Department of State to member status.

THE TEXT OF EXECUTIVE ORDER 10807 OF 1959
WITH TITLE IV OF P.L. 94-282

EXECUTIVE ORDER

1-5-57
- - - -

TRAINING, ENGINEERING,
COUNCIL FOR SCIENCE AND TECHNOLOGY

Science and technology are essential resources for the
of the United States; and

central programs in science and technology will advance
and economic welfare and the quality of education in

inter-cooperation among Federal agencies will facilitate
on problems in science and technology, promote a
coordination, and otherwise improve the planning and
of programs in these fields:

WHERE, by virtue of the authority vested in me as
President, it is hereby ordered as follows:

Section ⁴⁰¹ ~~4~~ ¹ Establishment of Council. (a) There is hereby established the Federal Council for Science and Technology (hereinafter referred to as the Council).

Coordinating / , Engineering, and

(b) The Council shall be composed of the following designated members: (1) the Special Assistant to the President for Science and Technology, (2) one representative of each of the following named departments, who shall be designated by the Secretary of the Department concerned and shall be an official of the Department of policy rank: the Departments of Defense, the Interior, Agriculture, Commerce, and Health, Education, and Welfare, (3) the Director of the National Science Foundation, (4) the Administrator of the National Aeronautics and Space Administration, and (5) a representative of the Atomic Energy Commission, who shall be the Chairman of the Commission or another member of the Commission designated by the Chairman. A representative of the Secretary of State designated by the Secretary and a representative of the Director of the Bureau of the Budget designated by the Director may attend meetings of the Council as observers. Each such representative shall be an official of policy rank designated by the head of the Federal agency concerned.

Director of the Office of Policy / Federal agencies:

Department of Housing and Urban Development, Department of State, Department of Transportation, Veterans' Administration, Environmental Protection Agency, and Energy Research and Development Administration.

(c) The Chairman of the Council (hereinafter referred to as the Chairman) shall be designated by the President from time to time from among the members thereof. The Chairman may make provision for designate another member of the Council, with the consent of such members, to act temporarily as Chairman. in the Chairman's absence

Director / Office of Science and Technology Policy shall serve as Chairman of the Council.

(d) The Chairman (1) may request the head of any Federal agency not named in section 3(b) of this order to designate a representative to participate in meetings or parts of meetings of the Council concerned with matters of substantial interest to the agency, and (2) may invite other persons to attend meetings of the Council.

subsection / section

(e) The Council shall meet at the call of the Chairman.

[subsection] (e) ^

Section 2. Functions of Council. (e) ^ The Council shall consider problems and developments in the fields of science and technology and related activities affecting more than one Federal agency ~~or concerning the~~ over-all advancement of the Nation's science and technology, and shall recommend policies and other measures (1) to provide more effective planning and administration of Federal scientific and technological programs, (2) to identify research needs including areas of research requiring additional emphasis, (3) to achieve more effective utilization of the scientific and technological resources and facilities of Federal agencies, including the elimination of ~~unnecessary~~ duplication, and (4) to further international cooperation in science and technology. In developing such policies and measures the Council, ~~after consulting, when considered appropriate by the Chairman, the National Academy of Sciences, the President's Science Advisory Committee, and other organizations, shall~~ consider (i) the effects of Federal research and development policies and programs on non-Federal programs and institutions, (ii) long-range program plans designed to meet the scientific and technological needs of the Federal Government, including manpower and capital requirements, and (iii) the effects of non-Federal programs in science and technology upon Federal research and development policies and programs.

(b) ~~The Council shall consider and recommend measures for the effective implementation of Federal policies concerning the administration and conduct of Federal programs in science and technology.~~

(e) The Council shall perform such other related duties as shall be assigned, consonant with law, by the President or by the Chairman. advisory ^

(d) ~~The Chairman shall, from time to time, submit to the President such of the Council's recommendations or reports as require the attention of the President by reason of their importance or character.~~

[subsection] (g) carrying out the provisions of

Section 3. Agency assistance to Council. (a) For the purpose of effectuating this order, each Federal agency represented on the Council shall furnish necessary assistance to the Council in accordance with section 214 of the act of May 3, 1945, 59 Stat. 134 (31 U.S.C. 691). Such assistance may include (1) detailing employees to the Council to perform such functions, consistent with the purposes of this order, as the Chairman may assign to them, and (2) undertaking, upon request of the Chairman, such special studies for the Council as come within the functions herein assigned to the Council.

(b) Upon request of the Chairman, the heads of Federal agencies shall, so far as practicable, provide the Council with information and reports relating to the scientific and technological activities of the respective agencies.

[subsection] (h) subcommittees

Section 4. Standing committees and panels. (a) For the purpose of conducting studies and making reports as directed by the Chairman, standing committees and panels of the Council may be established in consonance with the provisions of section 214 of the act of May 3, 1945, 59 Stat. 134 (31 U.S.C. 691). At least one such standing committee shall be composed of scientist-administrators representing Federal agencies; shall provide a forum for consideration of common administrative policies and procedures relating to Federal research and development activities and for formulation of recommendations thereon, and shall perform such other related functions as may be assigned to it by the Chairman of the Council.

Section 5. Security procedures. The Chairman shall establish procedures to insure the security of classified information used by or in the custody of the Council or employees under its jurisdiction.

Section 4, Other orders construction of orders, (a) Executive Order No. 9912 of December 24, 1947, entitled "Establishing the Interdepartmental Committee on Scientific Research and Development," is hereby revoked.

(b) Executive Order No. 10521 of March 17, 1954, entitled "Administration of Scientific Research by Agencies of the Federal Government," is hereby amended:

(1) By substituting for section 1 thereof the following:

"Section 1. The National Science Foundation (hereinafter referred to as the Foundation) shall from time to time recommend to the President policies for the promotion and support of basic research and education in the sciences, including policies with respect to furnishing guidance toward defining the responsibilities of the Federal Government in the conduct and support of basic scientific research."

(2) By inserting before the words "scientific research programs and activities" in section 3 thereof the word "basic".

(3) (i) By adding the word "and" at the end of paragraph (a) of section 8 thereof, (ii) by deleting the semicolon and the word "and" at the end of paragraph (b) of section 8 and inserting in lieu thereof a period, and (iii) by revoking paragraph (c) of section 8.

(4) By adding to the end of the order a new section 10 reading as follows:

"Section 10. The National Science Foundation shall provide leadership in the effective coordination of the scientific information activities of the Federal Government with a view to improving the availability and dissemination of scientific information. Federal agencies shall cooperate with and assist the National Science Foundation in the performance of this function, to the extent permitted by law."

(c) ~~The provisions of Executive Order No. 10521, as hereby amended, shall not limit the functions of the Council under this order. The provisions of this order shall not limit the functions of any Federal agency or officer under Executive Order No. 10521, as hereby amended.~~

(d) ~~The Council shall be advisory to the President and to the heads of Federal agencies represented on the Council; accordingly, this order shall not be construed as subjecting any agency, officer, or function to control by the Council.~~

DWIGHT D. EISENHOWER

THE WHITE HOUSE,

March 13, 1959.

#

ABOLITION OF FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY
SEC. 402. The Federal Council for Science and Technology, established pursuant to Executive Order 10807, issued March 13, 1959, as amended by Executive Order 11381, issued November 8, 1967, is hereby abolished.

APPENDICES

- A. Statement by the President upon signing order establishing the Interdepartmental Committee for Scientific Research and Development, and Text of Executive Order 9912, December 24, 1947.
- B. Executive Order 10807, March 13, 1959, as amended by Executive Order 11381, November 8, 1967, establishing the Federal Council for Science and Technology.
- C. Executive Order 10521, March 17, 1954, as amended by Executive Order 10807, March 13, 1959, on administration of scientific research.
- D. Executive Order 11381, November 8, 1967, amending Executive Order 10807, March 13, 1959, relating to the Federal Council for Science and Technology.
- E. Letter to Dr. H. Guyford Stever from President Richard Nixon dated July 1, 1973, in which he designated Dr. Stever to be Chairman of the Federal Council for Science and Technology.
- F. Members and observers of the Federal Council for Science and Technology, May 1976.
- G. Chairmen, members, observers, and executive secretaries of the Federal Council for Science and Technology, from 1959 to May 1976.
- H. Report on Federal Council for Science and Technology, June 1962.
- I. Reports of the Federal Council for Science and Technology and its committees, 1959-1976.
- J. Presidential statements referring to the Federal Council for Science and Technology. Compiled by Karen J. Guarisco.
- K. Policy statements of the Federal Council for Science and Technology.
- L. The Interdepartmental Committee for Atmospheric Sciences: a case history. Prepared by Robert E. Morrison.
- M. The Interagency Committee on Oceanography: a case history. Prepared by John R. Justus.
- N. The Interagency Committee on Marine Science and Engineering: a case history. Prepared by Robert E. Morrison.
- O. Text of National Science and Technology Policy, Organization, and Priorities Act of 1976 (Public Law 94-282, May 11, 1976).

(for page references see table of contents, p. x.)

APPENDIX A

STATEMENT BY THE PRESIDENT
UPON SIGNING ORDER ESTABLISHING THE
INTERDEPARTMENTAL COMMITTEE FOR
SCIENTIFIC RESEARCH AND DEVELOPMENT
AND TEXT OF EXECUTIVE ORDER 9912, DECEMBER 24, 1947

APPENDIX A

U.S. President. (Harry S. Truman.) Public papers of the Presidents of the United States, 1947. Washington, U.S. Govt. Print. Off., 1963. p. 531.

Statement by the President Upon Signing Order Establishing the Interdepartmental Committee for Scientific Research and Development. December 24, 1947

I have today signed an Executive order establishing an Interdepartmental Committee for Scientific Research and Development. This Committee will maintain a continuing study of various aspects of the Federal Government's scientific programs and will recommend ways to make them most effective in promoting the national welfare. Its members will represent the Departments of Agriculture, Commerce, and Interior; the Army, the Navy, the Air Force, and the National Military Establishment; the Federal Security Agency; the Atomic Energy Commission; the National Advisory Committee for Aeronautics; the Veterans Administration; and the Smithsonian Institution.

The need for this Committee was emphasized in the recent report of the Chairman of the President's Scientific Research Board. The survey indicated there is no central group equipped to advise on the relationships among the numerous and complex Federal scientific activities, or to take leadership in the solution of administrative problems common to different agencies. The relationship of the Federal research program to our national welfare, and the great sums annually spent for research by the Government, make the establishment of such a group a matter of national importance.

The Interdepartmental Committee will perform for the entire Federal establishment functions similar to those now performed by committees and boards which coordinate research programs within single departments or among limited groups of departments. These functions will include review of administrative policies and techniques to increase the efficiency of scientific operations and examination of current policies and practices relating to Federal support of research carried on outside the Government. The Committee will encourage cooperation among the scientists of the various Government agencies and develop means by which information on research can be most effectively disseminated.

The Assistant to the President, John R. Steelman, will provide liaison between the President and the Interdepartmental Committee and between the office of the President and the Nation's scientists and their learned societies.

NOTE. The text of Executive Order 9912 "Establishing the Interdepartmental Committee on Scientific Research and Development" (3 CFR, 1943-1948 Comp., p. 676) was released with the President's statement.

EXECUTIVE ORDER 9912

ESTABLISHING THE INTERDEPARTMENTAL COMMITTEE ON SCIENTIFIC
RESEARCH AND DEVELOPMENT

By virtue of the authority vested in me as President of the United States by the Constitution and statutes, and as Commander in Chief, and in order to further the most effective administration of Federal scientific research and development activities, it is hereby ordered, in the interest of the internal management of the Government, as follows:

1. There is hereby established the Interdepartmental Committee on Scientific Research and Development, hereinafter referred to as the Committee. The head of each of the following agencies and of such other agencies as the President may hereafter determine (and in the case of a commission, board, or committee, the chairman thereof) shall designate an officer or employee of his agency as a member of the Committee, namely, the Departments of Agriculture, Interior, Commerce, Army, Navy, and Air Force, the National Military Establishment, the Federal Security Agency, the Atomic Energy Commission, the National Advisory Committee for Aeronautics, the Veterans Administration, and the Smithsonian Institution.

2. The Chairman of the Committee shall be designated annually by the President. The Chairman may from time to time establish subcommittees, which may include as members persons not employed by the Federal Government, or for limited periods of time representatives of agencies not designated as members of the Committee, which shall conduct and report upon specific studies as directed by the Committee.

3. The duties of the Committee shall be to:

(a) Recommend steps to make the research and development programs of the Federal Government most effective in the promotion of the national welfare.

(b) Study or propose studies and recommend changes in administrative policies and procedures, including personnel policies, designed to increase the efficiency of the Federal research and development program.

(c) Study and report upon current policies and Federal administrative practices relating to Federal support for research, such as grants and contracts for basic research.

(d) Obtain the advice of persons not employed by the Federal Government with respect to matters of concern to the Committee.

(e) Encourage collaboration among Federal agencies engaged in related scientific research and development.

(f) Propose means by which information relating to the status and results of scientific research and development undertaken or supported by Federal agencies can be most effectively disseminated.

(g) Perform such other duties as shall be prescribed from time to time by the President.

4. The reports and recommendations of the Committee shall be submitted to the several departments and agencies or to the President as may be appropriate.

5. Federal agencies, to the extent permitted by law, are requested to furnish the Committee assistance and such information relating to their affairs as it may require.

HARRY S. TRUMAN.

THE WHITE HOUSE,
December 24, 1947.

[F. R. Doc. 47-11422; Filed, Dec. 26, 1947; 11:37 a.m.]

APPENDIX B

EXECUTIVE ORDER 10807, MARCH 13, 1959

AS AMENDED BY EXECUTIVE ORDER 11381, NOVEMBER 8, 1967

ESTABLISHING THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

APPENDIX B

EXECUTIVE ORDER NO. 10807 FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY 8 NOVEMBER 1959

Ex. Ord. No. 10807, Mar. 13, 1959, 24 F.R. 1897, as amended by Ex. Ord. No. 11381, Nov. 8, 1967, 32 F.R. 15629, provided:

SECTION 1. *Establishment of Council.* (a) There is hereby established the Federal Council for Science and Technology (hereinafter referred to as the Council).

(b) The Council shall be composed of the Special Assistant to the President for Science and Technology and one representative of each of the following: Department of Agriculture, Department of Commerce, Department of Defense, Department of Health, Education and Welfare, Department of Housing and Urban Development, Department of the Interior, Department of State, Department of Transportation, Atomic Energy Commission, National Aeronautics and Space Administration, and National Science Foundation. Each such representative shall be an official of policy rank designated by the head of the Federal agency concerned, and, in the case of the Atomic Energy Commission, shall be its Chairman or another member of the Commission designated by the Chairman of the Commission. A representative of the Director of the Bureau of the Budget designated by the Director may attend meetings of the Council as an observer.

(c) The Chairman of the Council (hereinafter referred to as the Chairman) shall be designated by the President from time to time from among the members thereof. The Chairman may make provision for another member of the Council, with the consent of such member, to act temporarily as Chairman.

(d) The Chairman (1) may request the head of any Federal agency not named in section 2(b) of this order to designate a representative to participate in meetings or parts of meetings of the Council concerned with matters of substantial interest to the agency, and (2) may invite other persons to attend meetings of the Council.

(e) The Council shall meet at the call of the Chairman.

SEC. 2. *Functions of Council.* (a) The Council shall consider problems and developments in the fields of science and technology and related activities affecting more than one Federal agency or concerning the over-all advancement of the Nation's science and technology, and shall recommend policies and other measures (1) to provide more effective planning and administration of Federal scientific and technological programs, (2) to identify research needs including areas of research requiring additional emphasis, (3) to achieve more effective utilization of the scientific and technological resources and facilities of Federal agencies, including the elimination of unnecessary duplica-

tion, and (4) to further international cooperation in science and technology. In developing such policies and measures the Council, after consulting, when considered appropriate by the Chairman, the National Academy of Sciences, the President's Science Advisory Committee, and other organizations, shall consider (i) the effects of Federal research and development policies and programs on non-Federal programs and institutions, (ii) long-range program plans designed to meet the scientific and technological needs of the Federal Government, including manpower and capital requirements, and (iii) the effects of non-Federal programs in science and technology upon Federal research and development policies and programs.

(b) The Council shall consider and recommend measures for the effective implementation of Federal policies concerning the administration and conduct of Federal programs in science and technology.

(c) The Council shall perform such other related duties as shall be assigned, consonant with law, by the President or by the Chairman.

(d) The Chairman shall, from time to time, submit to the President such of the Council's recommendations or reports as require the attention of the President by reason of their importance or character.

SEC. 3. *Agency assistance to Council.* (a) For the purpose of effectuating this order, each Federal agency represented on the Council shall furnish necessary assistance to the Council in consonance with section 214 of the act of May 3, 1945, 59 Stat. 134 (31 U.S.C. § 691). Such assistance may include (1) detailing employees to the Council to perform such functions, consistent with the purposes of this order, as the Chairman may assign to them, and (2) undertaking, upon request of the Chairman, such special studies for the Council as come within the functions herein assigned to the Council.

(b) Upon request of the Chairman, the heads of Federal agencies shall, so far as practicable, provide the Council with information and reports relating to the scientific and technological activities of the respective agencies.

SEC. 4. *Standing committees and panels.* For the purpose of conducting studies and making reports as directed by the Chairman, standing committees and panels of the Council may be established in consonance with the provisions of section 214 of the act of May 3, 1945, 59 Stat. 134 (31 U.S.C. § 691). At least one such standing committee shall be composed of scientist-administrators representing Federal agencies, shall provide a forum for consideration of common administrative policies and procedures relating to Federal research and development activities and for formulation of recommendations thereon, and shall perform such other related functions as may be assigned to it by the Chairman of the Council.

SEC. 5. *Security procedures.* The Chairman shall establish procedures to insure the security of classified information used by or in the custody of the Council or employees under its jurisdiction.

SEC. 6. *Other orders; construction of orders.* (a) Executive Order No. 9912 of December 24, 1947, entitled "Establishing the Interdepartmental Committee on Scientific Research and Development," is hereby revoked.

(b) Executive Order No. 10521 of March 17, 1954 [set out as a note under this section], entitled "Administration of Scientific Research by Agencies of the Federal Government," is hereby amended:

(1) By substituting for section 1 thereof the following:

"SECTION 1. The National Science Foundation (hereinafter referred to as the Foundation) shall from time to time recommend to the President policies for the promotion and support of basic research and education in the sciences, including policies with respect to furnishing guidance toward defining the responsibilities of the Federal Government in the conduct and support of basic scientific research."

(2) By inserting before the words "scientific research programs and activities" in section 3 thereof the word "basic".

(3)(i) By adding the word "and" at the end of paragraph (a) of section 8 thereof, (ii) by deleting the semicolon and the word "and" at the end of paragraph (b) of section 8 and inserting in lieu thereof a period, and (iii) by revoking paragraph (c) of section 8.

(4) By adding at the end of the order a new section 10 reading as follows:

"SEC. 10. The National Science Foundation shall provide leadership in the effective coordination of the scientific information activities of the Federal Government with a view to improving the availability and dissemination of scientific information. Federal agencies shall cooperate with and assist the National Science Foundation in the performance of this function, to the extent permitted by law."

(c) The provisions of Executive Order No. 10521, as hereby amended, shall not limit the functions of the Council under this order. The provisions of this order shall not limit the functions of any Federal agency or officer under Executive Order No. 10521, as hereby amended.

(d) The Council shall be advisory to the President and to the heads of Federal agencies represented on the Council; accordingly, this order shall not be construed as subjecting any agency, officer, or function to control by the Council.

DWIGHT D. EISENHOWER.

APPENDIX C

EXECUTIVE ORDER 10521, MARCH 17, 1954
AS AMENDED BY EXECUTIVE ORDER 10807, MARCH 13, 1959
ON ADMINISTRATION OF SCIENTIFIC RESEARCH

APPENDIX C

EXECUTIVE ORDER NO. 10521 ADMINISTRATION OF SCIENTIFIC RESEARCH

Ex. Ord. No. 10521, Mar. 17, 1954, 19 F.R. 1499, as amended by Ex. Ord. No. 10807, § 6(b), Mar. 13, 1959, 24 F.R. 1899 provided:

SECTION 1. The National Science Foundation (hereinafter referred to as the Foundation) shall from time to time recommend to the President policies for the promotion and support of basic research and education in the sciences, including policies with respect to furnishing guidance toward defining the responsibilities of the Federal Government in the conduct and support of basic scientific research.

Sec. 2. The Foundation shall continue to make comprehensive studies and recommendations regarding the Nation's scientific research effort and its resources for scientific activities, including facilities and scientific personnel, and its foreseeable scientific needs, with particular attention to the extent of the Federal Government's activities and the resulting effects upon trained scientific personnel. In making such studies, the Foundation shall make full use of existing sources of information and research facilities within the Federal Government.

Sec. 3. The Foundation, in concert with each Federal agency concerned, shall review the basic scientific research programs and activities of the Federal Government in order, among other purposes, to formulate methods for strengthening the administration of such programs and activities by the responsible agencies, and to study areas of basic research where gaps or undesirable overlapping of support may exist, and shall recommend to the heads of agencies concerning the support given to basic research.

Sec. 4. As now or hereafter authorized or permitted by law, the Foundation shall be increasingly responsible for providing support by the Federal Government for general-purpose basic research through contracts and grants. The conduct and support by other Federal agencies of basic research in areas which are closely related to their missions is recognized as important and desirable, especially in response to current national needs, and shall continue.

Sec. 5. The Foundation, in consultation with educational institutions, the heads of Federal agencies, and the Commissioner of Education of the Department of Health, Education, and Welfare, shall study the effects upon educational institutions of Federal policies and administration of contracts and grants for scientific research and development, and shall recommend policies and procedures which will promote the attainment of general national research objectives and realization of the research needs of Federal agencies while safeguarding the strength and independence of the Nation's institutions of learning.

Sec. 6. The head of each Federal agency engaged in scientific research shall make certain that effective executive, organizational, and fiscal practices exist to ensure (a) that the Foundation is consulted on policies concerning the support of basic research, (b) that approved scientific research programs conducted by the agency are reviewed continuously in order to preserve priorities in research efforts and to adjust programs to meet changing conditions without imposing unnecessary added burdens on budgetary and other resources, (c) that applied research and development shall be undertaken with sufficient consideration of the underlying basic research and such other factors as relative urgency, project costs, and availability of manpower and facilities, and (d) that, subject to considerations of security and applicable law, adequate dissemination shall be made within the Federal Government of reports on the nature and progress of research projects as an aid to the efficiency and economy of the overall Federal scientific research program.

Sec. 7. Federal agencies supporting or engaging in scientific research shall, with the assistance of the Foundation, cooperate in an effort to improve the methods of classification and reporting of scientific research projects and activities, subject to the requirements of security of information.

Sec. 8. To facilitate the efficient use of scientific research equipment and facilities held by Federal agencies:

(a) the head of each such agency engaged in scientific research shall, to the extent practicable, encourage and facilitate the sharing with other Federal agencies of major equipment and facilities; and

(b) a Federal agency shall procure new major equipment or facilities for scientific research purposes only after taking suitable steps to ascertain that the need cannot be met adequately from existing inventories or facilities of its own or of other agencies; and

(c) the Interdepartmental Committee on Scientific Research and Development shall take necessary steps to ensure that each Federal agency engaged directly in scientific research is kept informed of selected major equipment and facilities which could serve the needs of more than one agency. Each Federal agency possessing such equipment and facilities shall maintain appropriate records to assist other agencies in arranging for their joint use or exchange.

Sec. 9. The heads of the respective Federal agencies shall make such reports concerning activities within the purview of this order as may be required by the President.

Sec. 10. The National Science Foundation shall provide leadership in the effective coordination of the scientific information activities of the Federal Government with a view to improving the availability and dissemination of scientific information. Federal agencies shall cooperate with and assist the National Science Foundation in the performance of this function, to the extent permitted by law.

APPENDIX D
EXECUTIVE ORDER 11381, NOVEMBER 8, 1967
AS AMENDED BY EXECUTIVE ORDER 10807, MARCH 13, 1959
RELATING TO THE
FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

APPENDIX D

Executive Order 11381. November 8, 1967

AMENDING EXECUTIVE ORDER NO. 10807 OF MARCH 13, 1959,
RELATING TO THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

By virtue of the authority vested in me as President of the United States, it is ordered that Executive Order No. 10807 of March 13, 1959, entitled "Federal Council for Science and Technology," be, and it is hereby, amended by substituting for subsection (b) of section 1 thereof the following:

"(b) The Council shall be composed of the Special Assistant to the President for Science and Technology and one representative of each of the following: Department of Agriculture, Department of Commerce, Department of Defense, Department of Health, Education, and Welfare, Department of Housing and Urban Development, Department of the Interior, Department of State, Department of Transportation, Atomic Energy Commission, National Aeronautics and Space Administration, and National Science Foundation. Each such representative shall be an official of policy rank designated by the head of the Federal agency concerned, and, in the case of the Atomic Energy Commission, shall be its Chairman or another member of the Commission designated by the Chairman of the Commission. A representative of the Director of the Bureau of the Budget designated by the Director may attend meetings of the Council as an observer."

LYNDON B. JOHNSON.

The White House
November 8, 1967.

APPENDIX E

LETTER TO H. GUYFORD STEVER

DIRECTOR, NATIONAL SCIENCE FOUNDATION

FROM PRESIDENT RICHARD M. NIXON, DATED JULY 1, 1973

IN WHICH HE DESIGNATED DR. STEVER TO BE

CHAIRMAN OF THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

APPENDIX E

[LETTER TO DR. STEVER AS REORGANIZATION PLAN NO. 1 BECAME EFFECTIVE]

THE WESTERN WHITE HOUSE,
San Clemente, July 1, 1973.

HON. H. GUYFORD STEVER,
*Director, National Science Foundation,
Washington, D.C.*

DEAR MR. STEVER: Today marks a significant milestone in the way that the Federal Government is organized to evaluate and coordinate science and technology programs. In accordance with the provisions of Reorganization Plan No. 1 of 1973, activities formerly vested in the Office of Science and Technology are transferred to you as Director of the National Science Foundation. I am especially pleased that you have already taken preparatory steps to carry out these new responsibilities and that you have established a new Science and Technology Policy Office to assist you with your increased duties.

As I indicated in January, I also want to take this occasion to designate you as my Science Advisor. In this post, I would like you to advise and assist the White House, the Office of Management and Budget, the Domestic Council and other entities within the Executive Office of the President on matters where scientific and technological expertise is needed, and to act as my representative in various international scientific undertakings. I believe this designation should significantly strengthen the science policy machinery of the Administration.

I also designate you as Chairman of the Federal Council for Science and Technology, a role which you have already undertaken in an acting capacity.

This Administration is committed to continuing a strong national effort in science and technology, and I know you will carry out these responsibilities in a manner consistent with this objective. I look forward to working with you in meeting this goal.

With every best wish,
Sincerely,

RICHARD NIXON.

APPENDIX F

MEMBERS AND OBSERVERS OF THE
FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY
MAY 1976

APPENDIX F

FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY
MAY 1976

<u>Members</u>	<u>Phone</u>
Dr. H. Guyford Stever Chairman, FCST National Science Foundation Washington, D. C. 20550	632-4001
Mr. William C. Bartley Executive Secretary, FCST National Science Foundation Washington, D. C. 20550	632-6320
Dr. Richard C. Atkinson Deputy Director National Science Foundation Washington, D. C. 20550	632-4376
Dr. Robert W. Long Assistant Secretary for Conservation, Research and Education Department of Agriculture Washington, D. C. 20250	447-2796
Dr. Robert C. Seamans, Jr. Administrator U. S. Energy Research and Development Administration Washington, D. C. 20545	376-4010
Dr. Betsy Ancker-Johnson Assistant Secretary for Science and Technology Department of Commerce Washington, D. C. 20230	377-3111
Dr. Malcolm R. Currie Director of Defense Research and Engineering Department of Defense Washington, D. C. 20301	697-9111
Dr. Theodore Cooper Assistant Secretary for Health Department of Health, Education and Welfare Washington, D. C. 20201	245-7694

<u>Members (cont'd)</u>	<u>Phone</u>
Dr. William M. Morrill Assistant Secretary for Planning and Evaluation Department of Health, Education and Welfare Washington, D. C. 20201	245-1858
Dr. Charles J. Orlebeke Assistant Secretary for Policy Development and Research Department of Housing and Urban Development Washington, D. C. 20410	755-5600
Dr. Hermann Enzer Director, Office of Minerals Policy and Research Analysis Department of the Interior Washington, D. C. 20240	343-8696
Dr. James C. Fletcher Administrator National Aeronautics and Space Administration Washington, D. C. 20546	755-3918
Ambassador Frederick Irving Assistant Secretary for Oceans and International Environmental and Scientific Affairs Department of State Washington, D. C. 20520	632-1554
Dr. Hamilton Herman Assistant Secretary of Transportation for Systems Development and Technology Department of Transportation Washington, D. C. 20590	426-4461
Dr. William L. Fisher Assistant Secretary for Energy and Minerals Department of the Interior Washington, D. C. 20240	343-5781
Dr. Russell Train Administrator Environmental Protection Agency Washington, D. C. 20460	755-2700

Members (cont'd)Phone

Mr. Frank Zarb Administrator Federal Energy Administration Washington, D. C. 20461	961-6081
Marcus A. Rowden Chairman U.S. Nuclear Regulatory Commission Washington, D. C. 20555	492-7891

Observers

Dr. Robert Mikulak Fiscal Science Officer U.S. Arms Control and Disarmament Agency Washington, D. C. 20451	632-7374
Mr. John Darroch Senior Staff Economist Council of Economic Advisors Washington, D. C. 20506	395-5040
Dr. Lee M. Talbot Senior Scientist Council on Environmental Quality Washington, D. C. 20006	382-1254
Dr. Richard F. Hill Federal Power Commission Washington, D. C. 20426	275-4891
Mr. Gerald M. Caplan National Institute of Law Enforcement and Criminal Justice Department of Justice Washington, D. C. 20530	376-3606
Mr. Hugh F. Loweth Deputy Associate Director for Energy and Science Office of Management and Budget Washington, D. C. 20503	395-3404

<u>Observers (cont'd)</u>	<u>Phone</u>
Dr. Wilson K. Talley Assistant Administrator for Research and Development Environmental Protection Agency Washington, D. C. 20460	755-2600
Dr. Ernest Ambler Acting Director National Bureau of Standards Washington, D. C. 20234	921-2411
Dr. Robert M. White Administrator, National Oceanic and Atmospheric Administration Department of Commerce Washington, D. C. 20230	377-3567
Dr. S. Dillon Ripley Secretary Smithsonian Institution Washington, D. C. 20560	381-5005
Dr. Lyndon E. Lee, Jr. Special Assistant to the Chief Medical Director Veterans Administration Washington, D. C. 20420	389-7267
Dr. Joseph Blair Environmental Health Advisor Federal Energy Administration Washington, D. C. 20461	961-8673
Mr. Harold K. Fletcher Associate Administrator for Procurement Assistance Small Business Administration Washington, D. C. 20416	653-6635

APPENDIX G

CHAIRMAN, MEMBERS, OBSERVERS AND EXECUTIVE SECRETARIES
OF THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY
FROM 1959 TO MAY 1976

APPENDIX G

FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Chairmen, Members, Observers and
Executive SecretariesFrom 1959 to May 1976

<u>Chairmen 1/</u>	<u>From</u>	<u>To</u>
<u>Special Assistant to the President for Science and Technology</u>		
Killian, James R.	3/59	7/59
Kistiakowsky, George B.	7/59	1/61
Wiesner, Jerome B.	1/61	1/64
Hornig, Donald F.	1/64	1/69
<u>Science Adviser to the President</u>		
DuBridge, Lee A.	1/69	8/70
David, Edward E., Jr.	9/70	2/73*
Stever, H. Guyford	7/73**	Present
<u>Executive Secretaries</u>		
<u>Office of Science and Technology</u>		
Kreidler, Robert N.	3/59	7/61
Wenk, Edward, Jr.	7/61	10/64
Kidd, Charles V.	11/64	7/69
Ward, Eric B.	7/69	11/70
Beckler, David Z. (Acting)	11/70	2/71
Goldmuntz, Lawrence A.	2/71	10/72
De Simone, Daniel V.	10/72	12/73
Drew, Russell C. (Acting)	1/74	3/75
Granger, John V.	3/75	3/76
Bartley, William C.	3/76	Present

1/ Also serve(s)(d) as Director, Office of Science and Technology

* See Reorganization Plan #1

** Acting Chairman, May 1973-July 1973

<u>Members</u>		<u>From</u>	<u>To</u>
<u>Department of Agriculture</u>			
Peterson, E. L.	Asst. Secy. for Fed. - State Relations	3/59	/60
Ferguson, Clarence M.	Dir. of the Agricultural Extension Service	9/60	1/61
Selke, George A.	Asst. to the Secretary of Agriculture	3/61	7/61
Welch, Frank J.	Asst. Secy. for Fed. - State Relations	9/61	7/62
Elting, E. C.	(Acting)	7/62	11/62
Cochrane, Willard	Director, Agricultural Economics	12/62	1/64
Brady, Nyle C.	Director, Science & Education	1/64	9/65
Mehren, George L.	Asst. Secretary	10/65	6/68
Bayley, Ned D.	Director, Science & Education	7/68	3/73
Long, Robert W.	Asst. Secretary for Conservation, Research and Education	4/73	
<u>Atomic Energy Commission</u>			
Libby, Willard F.	Commissioner	3/59	6/59
Williams, John H.	Commissioner	8/59	6/60
Floberg, John (attended for Williams)		1/60	3/60
Wilson, Robert E.	Commissioner	8/60	1/61
Seaborg, Glenn T.	Chairman	3/61	7/71
Schlesinger, James R.	Chairman	8/71	2/73
Ray, Dixy Lee	Chairman	2/73	1/75
<u>Energy Research and Development Administration</u>			
Seamans, Robert C., Jr.	Administrator	5/75	3/76
<u>Nuclear Regulatory Commission</u>			
Anders, William	Chairman	5/75	4/76
Rowden, Marcus A.	Chairman	4/76	
<u>Environmental Protection Agency</u>			
Train, Russell	Administrator	5/75	
<u>Federal Energy Administration</u>			
Frank Zarb	Administrator	5/75	

Members (cont'd)From ToDepartment of Commerce

Strauss, Lewis L.	Secretary	3/59	7/59
Astin, Allen V.	(Acting)	7/59	10/59
Ray, Philip A.	Under Secretary	10/59	1/61
Gudeman, Edward	Under Secretary	3/61	4/62
Hollomon, J. Herbert	Asst. Secy. for S&T	5/62	8/67
Astin, Allen V.	(Acting)	8/67	10/67
Kincaid, John F.	Asst. Secy. for S&T	10/67	2/69
Tribus, Myron	Asst. Secy. for S&T	3/69	11/70
Simpson, Richard	(Acting)	11/70	3/71
Wakelin, James H.	Asst. Secy. for S&T	3/71	4/73
Ancker-Johnson, Betsy	Asst. Secy. for S&T	4/73	

Department of Defense

York, Herbert F.	Dir. of Def. Res. & Eng.	3/59	4/61
Brown, Harold	Director of Res. & Eng.	5/61	9/65
Foster, John S., Jr.	Dir. of Def. Res. & Eng.	10/65	6/73
Currie, Malcolm R.	Dir. of Def. Res. & Eng.	6/73	

Department of Health, Education and Welfare

McGuinness, Aims C.	Spec. Asst. to Secy. for Health and Med. Affairs	3/59	10/59
Craig, Winchell	Spec. Asst. to Secy. for Health and Med. Affairs	10/59	2/60
Pond, M. Allen	(Acting) Staff Asst., Office of Spec. Asst. to Secy. for Health and Medical Affairs	2/60	3/61
Jones, Boisfeuillet	Spec. Asst. to Secy. for Health and Med. Affairs	3/61	6/64
Stewart, William H.	(Acting)	7/64	10/64
Dempsey, Edward W.	Spec. Asst. to Secy. for Health and Med. Affairs	10/64	11/65
Lee, Philip R.	Asst. Secy. for Health and Scientific Affairs	12/65	2/69
Stewart, William H.	(Acting)	3/69	7/69
Egeberg, Roger O.	Asst. Secy. for Health and Scientific Affairs	7/69	10/71
DuVal, Merlin K.	Asst. Secy. for Health and Scientific Affairs	10/71	12/72
Edwards, Charles C.	Asst. Secy. for Health	4/73	1/75
* Morrill, William M.	Asst. Secy. for Planning and Evaluation	10/74	
* Cooper, Theodore	Asst. Secy. for Health	1/75	

* Two representatives from HEW

Members (cont'd)From ToDepartment of Housing and Urban Development*

Rogers, Thomas F.	Dir., Office of Urban Tech. and Research	11/67	5/69
Finger, Harold B.	Asst. Secy. for Research and Technology	5/69	12/72
Moskow, Michael H.	Asst. Secy. for Policy Development and Research	4/73	2/76
Orlebeke, Charles J.	Asst. Secy. for Policy Development and Research	3/76	

Department of the Interior

Bennett, Elmer F.	Under Secretary	3/59	6/60
Meetings attended by various staff members		7/60	8/61
Revell, Roger	Under Secretary; later Science Adviser to the Secy.	8/61	4/63
Calhoun, John C.	Science Adviser to the Secy.	4/63	1/65
Bates, Thomas F.	Science Adviser to the Secy.	2/65	5/67
Schaefer, Milner B.	Science Adviser to the Secy.	7/67	2/69
Dunlop, Donald D.	Science Adviser to the Secy.	3/69	11/70
Prochnik, Martin	(Acting)	1/71	6/71
Pecora, William T.	Under Secretary	6/71	7/72
Lynn, Laurence E.	Asst. Secy. for Program Development and Budget	4/73	1/74
Furlong, LeRoy R.	Chief Scientist, Office of R&D	1/74	2/75
Carlson, Jack C.	Asst. Secy. for Energy and Minerals	10/74	1/76
Johnson, Harry	Acting Dir., Office of R&D	2/75	6/75
**Enzer, Hermann	Dir., Office of Minerals Policy and Res. Analysis	9/75	
**Fisher, William L.	Asst. Secy. for Energy and Minerals	1/76	

National Aeronautics and Space Administration

Glennan, T. Keith	Administrator	3/59	1/61
Webb, James E.	Administrator	1/61	10/68
Paine, Thomas O.	Administrator	10/68	9/70
Low, George M.	Deputy Administrator (Acting)	9/70	4/71
Fletcher, James. C.	Administrator	7/71	

* Membership status per Executive Order 11381, 11/8/67. The following representatives of HUD formerly accorded observer status:

Wood, Robert C.	2/67	7/67
Rogers, Thomas F.	7/67	11/67

** Two representatives for the Department of Interior

Members (cont'd)From ToNational Science Foundation

Waterman, Alan T.	Director	3/59	7/63
Haworth, Leland J.	Director	7/63	7/69
McElroy, W. D.	Director	7/69	2/72
Steuer, H. Guyford	Director	2/72	7/73*
Atkinson, Richard C.	Deputy Director	2/76	

Department of State**

Pollack, Herman	Dir., Bureau of International Scientific and Technological Affairs	11/67	8/74
Granger, John V.	Deputy Asst. Secy. for Scientific and Technological Affairs	8/74	1/75
Ray, Dixy Lee	Asst. Secy. for Oceans and International Environmental and Scientific Affairs	1/75	6/75
Kratzer, Myron	Acting Asst. Secy. for Oceans and International Environmental and Scientific Affairs	6/75	4/76
Irving, Amb. Frederick	Asst. Secy. for Oceans and International Environmental and Scientific Affairs	4/76	

* No NSF representative from 7/73 to 2/76

** Membership status per Executive Order 11381, 11/8/67. The following representatives of the State Department formerly accorded observer status:

Brode, Wallace	Science Adviser to the Secretary	3/59	9/60
Whitman, Walter G.	Science Adviser to the Secretary	9/60	9/62
Rollefson, Ragnar	Dir., Office of International Scientific Affairs	9/62	9/64
Kretzmann, Edwin M. J.	Acting Dir., Office of International Scientific Affairs	9/64	12/64
Pollack, Herman		1/65	11/67

Members (cont'd)FromToDepartment of Transportation *

Densmore, James E.	Acting Asst. Secy. for Research and Technology	11/67	4/68
Lehan, Frank W.	Asst. Secy. for Research and Technology	4/68	3/69
Browne, Secor D.	Asst. Secy. for Research and Technolgy	3/69	10/69
Beggs, James M.	Under Secretary	10/69	3/70
Cannon, Robert H., Jr.	Asst. Secy. of Transp. for Systems Development and Technology	3/70	8/74
Stoney, William	Acting Asst. Secy. of Transp. for Systems Development and Technology	8/74	10/75
Herman, Hamilton	Asst. Secy. of Transp. for Systems Development and Technology	11/75	

* Membership status per Executive Order 11381, 11/8/67. The following representatives of FAA formerly accorded observer status:

Halaby, N. E.	Administrator	6/62	6/65
McKee, Gen. William F.	Administrator	7/65	11/67

<u>Observers</u>		<u>From</u>	<u>To</u>
<u>Arms Control and Disarmament Agency</u>			
Scoville, Herbert, Jr.	Acting Asst. Director, Science and Technology Bureau	2/65	4/69
Graybeal, Sidney N.	Acting Asst. Director, Science and Technology Bureau	4/69	8/69
Keeny, Spurgeon M.	Asst. Director for Science and Technology	8/69	4/73
Zemach, Charles	Senior Officer	8/73	10/74
Mikulak, Robert	Fiscal Science Officer	10/74	
<u>Council of Economic Advisers</u>			
Mills, Edwin S.	Staff Economist	5/65	11/65
MacAvoy, Paul W.	Staff Economist	11/65	6/66
Carlson, Jack W.	Staff Economist	6/66	4/68
Nelson, Saul	Senior Staff Economist	5/68	11/70
Darroch, John D.	Senior Staff Economist	12/70	
<u>Council on Environmental Quality (Invited to be observer 1970)</u>			
Train, Russell E.	Chairman	7/70	7/73
Talbot, Lee M.	Senior Scientist	8/73	
<u>Environmental Protection Agency</u>			
Elkins, Charles	(Acting)	1/71	3/71
Greenfield, Stanley M.	Asst. Administrator	3/71	5/74
Tratowski, Albert	Acting Asst. Adminis- trator for R&D	5/74	12/74
Talley, Wilson K.	Asst. Administrator for R&D	12/74	
<u>Federal Power Commission</u>			
Nassikas, John N.	Chairman	1/72	10/75
Hill, Richard F.	Chief Engineer and Director, Office of Energy Systems	11/75	

Observers (cont'd)From ToDepartment of Justice

Siu, Ralph G. H.	Assoc. Admin., Law Enforcement Assistance Administration	11/68	3/69
Ruth, Henry S.	Dir., Nat. Inst. of Law Enforcement and Criminal Justice	5/69	3/70
Slott, Irving	Acting Dir., Nat. Inst. of Law Enforcement and Criminal Justice	3/70	10/71
Danziger, Martin B.	Acting Asst. Admin., Nat. Inst. of Law Enforcement and Criminal Justice	10/71	7/73
Caplan, Gerald M.	Nat. Inst. of Law Enforcement and Criminal Justice	10/73	

National Aeronautics & Space Council

Anders, William A.	Executive Secretary	7/70	7/73
--------------------	---------------------	------	------

Office of Economic Opportunity

Levine, Robert	Dir., Office of Research, Plans, Programs and Evaluation	8/68	1/69
Ottman, Richard F.	Acting Dir., Office of Research, Plans, Programs and Evaluation	3/69	12/69
Wilson, John Oliver	Dir., Office of Planning, Research and Evaluation	3/70	12/71
Glennan, Thomas K., Jr.	Dir., Office of Planning, Research and Evaluation	2/72	12/72

Office of Management and Budget *

Staats, Elmer B.	Deputy Director	3/59	4/66
Carey, William D.	Asst. Director	4/66	9/67
Young, John D.	Dir., Economics, Science and Tech. Programs Div.	9/67	3/69
Loweth, Hugh F.	Asst. Dir., (Gen. Science) Economics, Science and Tech. Programs Div.	3/69	9/70
Rice, Donald B.	Asst. Dir., Science, Tech. and Natural Resources	9/70	4/72
Loweth, Hugh F.	Deputy Associate Director for Energy and Science; formerly Chief, General Science Branch, Energy and Science Division	4/72	

* 7/1/70 changed from Bureau of the Budget.

Observers (cont'd)From ToSmithsonian Institution

Ripley, S. Dillon	Secretary	2/66	
Challinor, David	Asst. Secy. for Science (Second Observer)	4/71	

Veterans Administration

Chalmers, Thomas C.	Asst. Chief Medical Dir. for Research and Education in Medicine	8/68	3/69
Bernstein, Lionel M.	Dir., Research Service, Dept. of Medicine and Surgery	3/69	2/70
Lee, Lyndon E.	Special Asst. to Chief Medical Dir., formerly Asst. Chief Medical Dir. for Professional Services	3/70	

Federal Energy Administration

Weinberg, Alvin	(Energy R&D Office)	10/74	12/74
Blair, Joseph	Environmental Health Adviser	12/74	

Department of Justice

Caplan, Gerald M.	(National Institute of Law Enforcement and Criminal Justice)	9/73	
-------------------	--	------	--

National Bureau of Standards

Roberts, Richard W.	Director	6/73	6/75
Ambler, Ernest	Acting Director	7/75	

National Oceanographic and Atmospheric Administration

White, Robert M.	Administrator	6/73	
------------------	---------------	------	--

Small Business Administration

Fletcher, Harold K.	Assoc. Admin. for Procurement Assistance	9/74	
---------------------	---	------	--

APPENDIX H

REPORT ON FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY,
JUNE 1962

APPENDIX H

REPORT ON FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY
June 1962

Source: U.S. Congress. Senate. Committee on Government Operations. Create a Commission on Science and Technology. Hearing before the Committee on Government Operations, 87th Congress, 2d session on S.2771. July 24, 1962. Washington, U.S.Govt.Print.Off., 1962. Part 2, pp. 99-169. At pp. 159-167

EXECUTIVE OFFICE OF THE PRESIDENT,
BUREAU OF THE BUDGET,
Washington, D.C., June 26, 1962.

HON. JOHN L. MCCLELLAN,
Chairman, Committee on Government Operations,
U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: During my recent testimony before your committee on S. 2771, a bill for the establishment of a Commission on Science and Technology, I agreed to provide additional information on the kinds of matters being considered by the President's science advisory machinery. Your committee has in the past indicated a particular interest in the planning, conduct and coordination of scientific and technical activities involving a number of agencies.

Consequently, it is believed that the attached résumé of activities of the Federal Council for Science and Technology will provide background information that will be most useful to your committee.

The attached material indicates that the Federal Council is concerned with a wide range of program and administrative problems bearing on the Government's research and development efforts. The Council has been particularly helpful in dealing with questions of relative emphasis and balance in critical fields of science which engage the attention of a number of departments or agencies. In addition, the Council has concerned itself with the need to strengthen and improve the Government's capabilities to conduct scientific investigations in its own laboratories. The Council will be chaired by the Director of the Office of Science and Technology created by Reorganization Plan No. 2 of 1962, and in our judgment this combination of resources under the Director's leadership will greatly strengthen the potential for effective coordination of the Government's planning and administration of research and development.

If we can be of further assistance in your committee's consideration of S. 2771 please let us know.

Sincerely yours,

ELMER B. STAATS,
Deputy Director.

REPORT ON FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

A. AUTHORITY, FUNCTIONS, AND ORGANIZATION

1. Authority and membership

The Federal Council for Science and Technology (FCST) was established on March 13, 1959, by Executive Order 10807. Action was based upon a recommendation of the President's Science Advisory Committee set forth in its December 27, 1958, report on "Strengthening American Science."

Membership of the Council is composed of the Special Assistant to the President for Science and Technology, together with officials of policy rank from the eight departments and agencies most heavily engaged in scientific research and development. Observers of policy rank from the Bureau of the Budget and Department of State have participated in deliberations of the Council; and an observer from Federal Aviation Agency has been recently added. Following precedent, President Kennedy, shortly after he took office, designated his Special Assistant for Science and Technology to serve as chairman. A list of members is attached.

2. Functions

As set forth in the order, the Council considers problems in the fields of science and technology affecting more than one Federal agency or concerning the overall advancement of the Nation's science and technology. More specifically, the Council, serving in an advisory capacity to the President and heads of member agencies concerned, is directed to recommend policies and other measures to—

(a) provide more effective planning and administration of Federal scientific and technological programs;

(b) identify research needs, including areas of research requiring additional emphasis;

(c) achieve more effective utilization of the scientific and technological resources and facilities of Federal agencies, including the elimination of unnecessary duplication;

(d) further international cooperation in science and technology.

The Council is also directed to consider and recommend measures for effective implementation of Federal policies concerning administration and conduct of Federal programs in science and technology.

Although these functions are broadly stated, the Council has been highly selective in choosing topics to which it would devote its attention, study and continuing review.

The authority, missions and roles, actions and operations of individual agencies constitutes the predominant mechanism for the accomplishment of Federal programs in science and technology. However, the Federal Council responsibility cuts across all disciplines and all agencies to deal with both science and technology to make sure that these programs develop so as to be coherent, consistent and coordinated; and neither a plurality of fragmented programs, nor merely a super imposition of individual departmental activities.

3. Committees and panels

Interagency program planning and coordination by the Federal Council are based primarily on studies and recommendations generated through its committees and panels. One such standing committee is prescribed by the Executive order to be composed of scientist-administrators in the Federal service. Others have been established, both of an ad hoc or permanent nature, as required.

During the past year, four new permanent committees were established:

Committee on Long-Range Planning.

Committee on Natural Resources.

Subcommittee on Water Resources Research.

Committee on Science Information.

Other permanent committees are:

Standing Committee.

International Committee.

Interagency Committee on Oceanography.

Interdepartmental Committee on Atmospheric Sciences.

Coordinating Committee for Materials Research and Development.

Technical Committee on High Energy Physics.

Committees have addressed themselves to three major types of activities:

(a) Preparation of national programs in substantive fields—with coordinated planning (1) to assess the needs and opportunities of science, (2) to consider individual agency mission and roles, and (3) to formulate Government-wide programs and budgets, annually and on a long-term basis. Recommendations are made to the Federal Council regarding both the nature and level of programs. Upon endorsement, these programs serve as guidelines for budget submissions by participating agencies and as criteria for review by the Bureau of the Budget.

(b) Problems in the management and administration of Federal programs, including consideration of manpower, facilities and capital requirements, projected needs and effective utilization of scientific resources, and control over quality.

(c) Government-wide policies in science and technology, including the interrelationship between Federal and non-Federal activities, and international scientific programs.

4. Staffing

Principal staff assistance has been provided to the Federal Council by the Office of the Special Assistant to the President for Science and Technology. In accordance with section 3 of the Executive order, staffing of committees and panels is provided by participating agencies. Committee chairmen ordinarily design-

nate members of their own organization to assist. While this staff effort is usually on a part-time basis, the scope of activities in the case of the Interagency Committee on Oceanography now involves full-time assistance.

B. COUNCIL ACTIVITIES

1. Planning and administration of scientific and technological programs: Interagency programs are formulated by appropriate Council Committees with recommendations for program and budget; these are then reviewed by the Council to evaluate balance, scope, consistency and match with needs of science, as follows:

- Oceanography.
- Atmospheric sciences.
- Water resources.
- High energy physics.

2. Identification of research needs and new areas requiring additional emphasis or coordination:

- Behavioral sciences.
- Fire technology.
- Natural resources.
- Materials research.

3. Improved utilization of scientific and technological resources and facilities of the Federal Government, including elimination of unnecessary duplication, and measures for effective implementation of Federal policies concerning administration and conduct of Federal programs:

- (a) Science information—Government-wide policies and programs.
- (b) Long-range planning—Appointment of committee and request of NSF to prepare long-range projections of demand for scientific resources; manpower, facilities and funds.
- (c) Problems in recruitment and retention of superior scientific personnel in Government—both salary and environmental factors.
- (d) Conflict of interest regulations.
- (e) Establishment of governmentwide policies on—
 - Indirect costs;
 - Page charges (policy announced October 25, 1961);
 - Institutional grants.

(f) Problems in "quality control" over inhouse research and over assessment of proposals and monitoring of contract research.

(g) Study and development of policies in scientific and technical manpower.

4. International aspects of science:

- (a) Guidelines for development of consistent agency policies for oversea activities.
- (b) Mobilization of other agencies talents for use by AID.
- (c) Steps to improve the image abroad regarding U.S. science and technology.
- (d) Stimulation of an international program in special scientific areas—scientific hydrology.
- (e) Steps to strengthen free world science.

C. COMMITTEE FUNCTIONS AND ACTIVITIES

1. Standing committee

Functions.—Established in accordance with Executive Order 10807, the Standing Committee of Scientist-Administrators provides "a forum for consideration of common administrative policies and procedures relating to Federal research and development and for formulation of recommendations thereof." Six ad hoc Panels reflect the range of current topics of interest:

- (a) Environment and incentives for research;
- (b) Hydrology;
- (c) Methods for improving federally financed research;
- (d) Laboratory astrophysics;
- (e) National hydraulic laboratory;
- (f) Office of critical tables.

(a) The Panel on Environment and Incentives for Research has concentrated on problems concerning recruitment and retention of superior scientists and engineers in the Federal service. Three reports on "Competition for Quality" have been completed regarding salary factors, nonsalary factors, and documenta-

tion of dimensions of the Federal personnel problem. The first and third reports were used in development of the President's proposals for pay reform, now before the Congress. The second was released May 13 with a Presidential directive to implement those recommendations which can be administratively accomplished so as to improve Federal personnel administration and the effectiveness of overall management.

(b) The Hydrology Panel identified expanding research activities in scientific hydrology and the training of manpower as necessary prerequisites to a meaningful attack on the water resources problem. Findings set forth in a series of reports were considered in agency proposals for a fiscal year 1963 program prepared by the Subcommittee on Water Resources. These reports are now being prepared for public distribution. The Panel also developed a plan for international cooperation in hydrology which was accepted by the Federal Council. As a followup the National Academy of Sciences has been asked to consider initiation of international programs through international scientific channels, to meet the needs and opportunities of science, while the Council Subcommittee on Water Resources Research will be developing proposals for collateral intergovernmental programs through UNESCO.

(c) The Panel on Methods for Improving Federally Financed Research initiated a study in depth to identify problems and to suggest methods for improving management of both inhouse and contract research. This group will assist the Office of Science and Technology in studying the possibility of establishing a forum for an exchange of information between agencies on contractor evaluation techniques and the best means for providing information on this subject.

(d) The Laboratory Astrophysics Panel undertook a special review of the status of the field which has led to the establishment of a Joint Institute of Laboratory Astrophysics at the University of Colorado (Boulder).

(e) The National Hydraulic Laboratory Panel is evaluating missions and activities of the Bureau of Standards and other agencies engaged in hydraulics research to determine if mission statements should be revised.

(f) The Office of Critical Tables Panel was established to study problems of long-term financing.

2. International Committee

Functions.—Established in September 1959 on the recommendation of the Science and Foreign Affairs Panel of the President's Science Advisory Committee, the International Committee is concerned with U.S. Government participation and support of international scientific activities, compatible with our foreign policy as follows:

1. More effective planning and administration of international Federal programs and activities in science and technology, with emphasis on research contracting, exchange of persons, and information exchange programs. Included are: (a) Surveys of current and planned international programs and policies of Federal and non-Federal agencies, (b) consideration of the effects of international policies and programs of the United States and foreign countries on domestic scientific programs and institutions, (c) consideration of multilateral planning among United States and foreign, Federal, and non-Federal organizations where approximate, and (d) study of the long-range program projections of Federal agencies and their relation to the long-range programs of non-Federal agencies.

2. The exploration of new opportunities for furthering international scientific cooperation and for lending support for international scientific programs.

3. The review of U.S. Government participation in science programs of international organizations and recommendation of policies to enhance U.S. participation where appropriate.

Activities.—The International Committee has studied operational guidelines for foreign scientific activities of Federal agencies concerning:

(a) U.S. participation in international scientific organizations.

(b) Support of research in foreign countries by U.S. agencies.

(c) U.S. participation in international scientific and technical organizations and meetings.

(d) The image of U.S. science abroad.

(e) Technological potential and capacity as a factor in technical assistance.

The study is being used by agencies to evaluate their current practices.

3. Committee on Long-Range Planning

Functions.—Considering the rapid growth in national programs of science and technology and the heightened competition for limited resources, the Council deemed more systematic planning on a continuing Government-wide basis as necessary. Accordingly, the Council recommended recent appointment of a new committee concerned with long-range planning to consider:

- (a) Identification and coordination of long-range Federal goals in science and technology.
- (b) Preparation of an inventory of resources—manpower and facilities.
- (c) Projection of future demands for resources and funding.
- (d) Government-wide program planning to minimize gaps and redundancies, and to achieve maximum utilization of resources.
- (e) Formulation of recommendations for program emphasis and allocation of resources.
- (f) Function as a clearinghouse of information on planning techniques, to aid departments and agencies in formulating their individual plans and programs, and to develop methodology for long-range Government-wide planning.

The Committee will look to the new Office of Scientific Resources Planning of the National Science Foundation in developing staff information on which to base policy recommendations.

4. Interagency Committee on Oceanography

Function.—Soon after formation of the Federal Council in 1959, the Subcommittee on Oceanography—later the Interagency Committee on Oceanography—was established to assume the role that had previously been carried informally by the Coordinating Committee on Oceanography. This action thus provided coordination of a Federal program whose growth reflected response to recommendations by the National Academy of Sciences Committee on Oceanography (NASCO) that this area of science needed stimulation.

The mission of the Interagency Committee on Oceanography is to develop, annually, a national oceanographic program, incorporating its best judgment as to balance and emphasis in terms of both long-range scientific needs and requirements of Government agencies by:

- 1. Reviewing current activities and planned programs of individual agencies in the context of the Government's overall long-range effort.
- 2. Engaging in coordinated budget planning so as to recommend level of funding required for each fiscal year.
- 3. Considering special problems that may arise in implementing the national program and recommending solutions therefor.

In addition, the Committee is to consider any other matters it deems relevant and important in advancing oceanography in the national interest.

In this regard, the ICO has prepared programs and budgets on a functional as well as agency basis and has undertaken the coordination of planning of scientific programs, oceanwide surveys, the design and development of oceanographic instrumentation and the procurement of oceanographic ships. It operates through panels on:

- (a) Research.
- (b) Surveys.
- (c) Training and manpower.
- (d) Oceanographic ships.
- (e) Instrumentation and facilities.
- (f) International programs.

In carrying out these functions, the ICO also calls on the informal Coordinating Committee on Oceanography, outside consultants and the NASCO for advice and comment.

The development of Government-wide programs in oceanography includes:

- (a) Preparation of program plans on a functional basis by panels of the ICO; their screening, refinement, and consolidation by the parent committee;
- (b) Evaluation of that program by an independent panel of consultants, reporting to the special assistant, to determine if the recommendations meet the needs of science (with the 10-year projections of NASCO as background); and
- (c) Consideration of these proposals, recommendations and comments by the Council, with endorsement that represents a unified and coherent program and budget to guide participating agencies in their preparation of budget submissions, and aid Bureau of the Budget in its program review.

National programs for fiscal year 1961 and fiscal year 1962 have been previously submitted to the Congress. The program for fiscal year 1963 is being prepared for transmittal in June 1962. ICO operations were the subject of extensive hearings by both Senate Commerce and House Merchant Marine and Fisheries Committees. Recent and comprehensive details on ICO operations were furnished to the House at hearings February 28, March 1 and 2, 1962.

The ICO is now concentrating on:

(a) Developing 10-year projections in all agencies which will be consolidated into a long-range Federal program in oceanography for presentation to the Council early in 1963.

(b) Studies in depth of causes and solution to manpower shortages.

(c) Development of a national program of oceanwide surveys and consideration of methods and organization by which participation can be made effective through UNESCO's Intergovernmental Oceanographic Commission.

(d) Encouragement of standardized practices by Federal agencies with regard to the design and procurement of oceanographic ships.

(e) The encouragement of industrial interests in solving problems in oceanographic instrumentation.

(f) Consideration of a National Test and Calibration Center similar to the National Oceanographic Data Center which ICO fostered as a clearing-house and repository for oceanographic data collected and used by all Federal agencies.

(g) Publication of schedules of operation for all U.S. oceanographic ships for a period of 12 months.

(h) Study of the cooperative tropical Atlantic investigation as part of the national survey program involving potential resources of the sea; with operational and planning leadership assigned the Bureau of Commercial Fisheries.

5. *Interdepartmental Committee for Atmospheric Sciences*

Functions.—First appointed in August 1959, the Interdepartmental Committee for Atmospheric Sciences undertakes studies as a whole or through ad hoc groups to include:

1. Evaluation of the national research effort in atmospheric sciences and the role and activities of Federal agencies therein.

2. Formulation of a plan for the orderly development of a well-balanced and integrated national program in the atmospheric sciences, including an evaluation of the need for specialized facilities and for the effective utilization of facilities.

3. Recommendations as to the appropriate allocation of responsibilities among Federal agencies and the development of effective means of coordination of agency programs. These recommendations also include a suggested timetable for the development of future programs, keeping in mind the statutory responsibility and capabilities of all agencies.

4. Recommendations as to measures by which the Federal Government could encourage maximum private contributions to the development of the field of atmospheric sciences.

5. Assistance to all agencies regarding the discharge of their statutory responsibilities.

Activities.—ICAS has continued its practice of holding monthly meetings which would take it on visits to all agencies having activities of interest, to establish firsthand contact and improve communication between technical people involved in the Government's farflung program.

A national program, initially developed in 1960, has been extended and refined, annually. However, after a definitive long-range program was completed by the National Academy of Sciences in September that identified research objectives, requirements, manpower and funds, the ICAS program is being developed in more detail.

In addition to development of coordinated interagency planning of a national program, ICAS has made recommendations on special issues, such as support for the National Center for Atmospheric Research, for continued weather reconnaissance by the Air Force, and for climatological research in the Weather Bureau.

6. Coordinating Committee on Materials Research and Development

Functions.—Established by the Council on March 24, 1959, the Coordinating Committee on Materials Research and Development has been concerned with steps to overcome delay in major Federal programs by any failure of materials technology to keep pace with needs. The Committee was charged with the responsibility to (1) devise programs for initiating action using existing funds, and (2) formulate a plan for meeting the needs of the Federal Government in materials. This Committee serves:

(a) To provide a forum whereby the major problems in the conduct of materials research of each agency represented can be identified and discussed on a systematic basis.

(b) To review the total materials effort of the Government, to identify gaps in applied research, to review the adequacy and quality of basic research, to meet immediate and long-range needs, and to effect coordination of the total materials effort within Government. A new subcommittee has been established to give more intensive study to problems in basic research.

(c) To review specific areas of research stimulated in support of some urgent national effort to determine whether the effort being expended is adequate to meet the needs.

Activities.—Early after its appointment, the CCMRD determined that progress in the field of materials research has been limited by a shortage of trained personnel and inadequate university research facilities and equipment. The CCMRD recommended to the Council in 1959 Federal support for construction of interdisciplinary laboratories for materials research on university campuses, supplementing existing agency support of basic materials research. Subsequently, the Council recommended an interdisciplinary materials laboratory program, since implemented by the Department of Defense through the Advanced Research Projects Agency and by the National Aeronautics and Space Administration and Atomic Energy Commission.

The CCMRD has concluded a study of the impact of this program on the total materials research effort, its effectiveness in reaching goals, and future steps.

Concurrently, the committee also is studying the facilities, capabilities, and problems of in-house operations of the Bureau of Standards and Bureau of Mines materials groups, to determine how they can be aided and encouraged to participate more significantly in the national materials effort.

Finally, based on analysis of reports and findings by other materials groups, the committee has identified a "List of Problems Deserving Further Study" transmitted October 1961 to the Joint Congressional Committee on Defense Production, in response to that committee's request, and published in their 11th annual report.

7. Technical Committee on High Energy Physics

Functions.—The Technical Committee on High Energy Physics was established upon the recommendation of a joint panel of the President's Science Advisory Committee and the General Advisory Committee of the Atomic Energy Commission that there should be an interagency committee at the policy level in the field of high energy physics. The committee conducts a technical review of the planning, support, and coordination of the national program in accordance with the following terms of reference:

1. Coordination of plans and programs of Federal agencies in the field of high energy physics to include review of major proposals for new accelerators.

2. Financial and technical problems associated with high energy accelerators to include the contracting procedures of Federal agencies for the support of research operations connected with high energy accelerators, to assure that such procedures properly support scientific undertakings of the attendant magnitude and character.

3. The effectiveness and breadth of support of off-site user's current or proposed programs.

4. The major alteration and major instrumentation requirements of present and new accelerators.

5. The overall level of support of high energy physics to include preparation of long-range cost projections for meeting the scientific needs in the field.

6. The plans and programs for encouraging international collaboration and cooperation in the planning and design of future machines and the international use of facilities.

Activities.—The Committee has kept itself informed on the development of new interests in design studies and construction taking place throughout the world. Most of its members assisted in the preparation of a 10-year review of high energy physics funding requirements which was endorsed and transmitted to the Federal Council for Science and Technology on January 27, 1961. With this 10-year forecast as a base reference, the Committee also prepared a statement of issues likely to develop in fiscal year 1963 and made recommendations concerning fiscal year 1962, and fiscal year 1963 support. The members of the Committee also participated in a National Science Foundation forecast (January 1961) of scientific manpower demand-supply in the field of high energy physics.

8. Committee on Natural Resources

Functions.—The Committee on Natural Resources was established March 29, 1961, in response to the President's request that the Council review ongoing Federal research activities related to natural resources and determine ways to strengthen the scientific effort. In the same message, the President requested the National Academy of Sciences to undertake a collateral study and evaluation of research related to conservation, use, and development of resources and of projects to provide a better basis for resources planning and management.

Activities.—The Federal Council Committee has joined with the Academy group to plan compatible but nonduplicating approaches to their respective assignments. Thus far, factual synopses have been received concerning:

- (a) consumers of resources—the growth of populations;
- (b) agricultural resources;
- (c) water resources;
- (d) energy resources.

The parent Committee plans to address itself to resources other than water at forthcoming meetings, paralleling agendas of the NAS group.

Subcommittees have begun inventories of ongoing research, and Government plans in preparation for the NAS study to be concluded this fall. Categories include: Minerals, water, land, atmosphere, energy, and economic factors.

Subcommittee on Water Resources Research.—The Subcommittee examined fiscal year 1963 plans and budgets of Federal agencies for water resources research to formulate a Government-wide research program to improve knowledge and to identify long-term effects, feasibility and merits of alternative actions. In the perspective of the Academy's preliminary report identifying the areas deserving priority attention, the Council endorsed the Subcommittee's fiscal year 1963 proposals.

Department of Interior plans to meet needs for an interdisciplinary approach to the hydrology problem by establishment of an Institute of Water Resources Research have been integrated into Government-wide programs for research for fiscal year 1963. A tabulation of all agency plans and an analysis of balance was completed in April and transmitted to both House and Senate Appropriations Committees.

AGENCY REPRESENTATIVES TO THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

- Department of Agriculture: Assistant Secretary for Federal-State Relations, Dr. Frank J. Welch.
- Department of Commerce: Assistant Secretary for Science and Technology, Dr. J. Herbert Hollomon.
- Department of Defense: Director of Research and Engineering, Dr. Harold Brown.
- Department of Health, Education, and Welfare: Special Assistant to the Secretary for Health and Medical Affairs, Mr. Boissefeuillet Jones.
- Department of Interior: Science adviser to the Secretary, Dr. Roger Revelle.
- Atomic Energy Commission: Chairman, Dr. Glenn T. Seaborg.
- National Science Foundation: Director, Dr. Alan T. Waterman.
- National Aeronautics and Space Administration: Administrator, Mr. James E. Webb.
- Office of Science and Technology: Acting Director, Dr. Jerome B. Wiesner (chairman).
- Office of Science and Technology: Technical assistant, Dr. Edward Wenk, Jr. (executive secretary).

OFFICIAL OBSERVERS

- Department of State: Science adviser to the Secretary, Dr. Walter G. Whitman.
- Bureau of the Budget: Deputy Director, Mr. Elmer B. Staats.
- Federal Aviation Agency: Administrator, Mr. N. E. Halaby.

APPENDIX I

REPORTS OF THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY AND ITS COMMITTEES, 1959-1976

SUMMARY REPORTS OF THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

JOINT REPORTS

STANDING COMMITTEE

COMMITTEE ON ACADEMIC SCIENCE AND ENGINEERING

INTERDEPARTMENTAL COMMITTEE FOR ATMOSPHERIC SCIENCES

INTERAGENCY ARCTIC RESEARCH COORDINATING COMMITTEE

INTERAGENCY COORDINATING COMMITTEE FOR ASTRONOMY

COMMITTEE ON AUTOMATION OPPORTUNITIES IN THE SERVICE AREAS

AD HOC COMMITTEE ON DOMESTIC TECHNOLOGY TRANSFER

AD HOC INTERAGENCY WORKING GROUP FOR EARTHQUAKE RESEARCH

COMMITTEE ON ENERGY RESEARCH AND DEVELOPMENT GOALS

COMMITTEE ON ENVIRONMENTAL QUALITY

AD HOC COMMITTEE ON ENVIRONMENTAL QUALITY RESEARCH AND DEVELOPMENT

INTERAGENCY COMMITTEE ON EXCAVATION TECHNOLOGY

COMMITTEE ON FEDERAL LABORATORIES

TECHNICAL COMMITTEE ON HIGH ENERGY PHYSICS

COMMITTEE ON INTERGOVERNMENTAL SCIENCE RELATIONS

INTERNATIONAL COMMITTEE

AD HOC COMMITTEE ON THE INTERNATIONAL GEODYNAMICS PROJECT

INTERAGENCY COMMITTEE ON MARINE SCIENCE AND ENGINEERING

COMMITTEE ON MATERIALS

COORDINATING COMMITTEE FOR MATERIALS RESEARCH AND DEVELOPMENT

COMMITTEE ON NATURAL RESOURCES

INTERAGENCY COMMITTEE ON OCEANOGRAPHY

PATENT ADVISORY PANEL AND COMMITTEE ON GOVERNMENT PATENT POLICY

AD HOC GROUP ON POPULATION RESEARCH

COMMITTEE ON SCIENTIFIC INFORMATION; COMMITTEE ON SCIENTIFIC AND TECHNICAL
INFORMATION

AD HOC WORKING GROUP ON SOLID EARTH SCIENCES

COMMITTEE ON WATER RESOURCES RESEARCH

SUMMARY REPORTS OF THE FEDERAL COUNCIL
FOR SCIENCE AND TECHNOLOGY

- U.S. Bureau of the Budget. Letter from Elmer B. Staats, Deputy Director, of June 26, 1962, to Chairman, Senate Committee on Government Operations, transmitting Report on Federal Council for Science and Technology. In U.S. Congress. Senate. Committee on Government Operations. Create a Commission on Science and Technology. Hearing before the . . . 87th Congr. 2d sess. Part 2. Washington, U.S. Govt. Print. Off., 1962, pp. 99-169. At pp. 159-66. [the first published report of the Federal Council for Science and Technology]
- U.S. Office of Science and Technology. Federal Council for Science and Technology; 1962 annual report. Washington, U.S. Govt. Print. Off., 21 p.
- Federal Council for Science and Technology; interim report on activities during calendar year 1963. February 1965. 15 p. and appendices. Processed.
- The role of the Federal Council for Science and Technology; report for 1963 and 1964. Washington, U.S. Govt. Print. Off., 1965, 53 p.
- Activities of the Federal Council for Science and Technology; report for 1965 and 1966. Washington, U.S. Govt. Print. Off., 1967, 47 p.
- Federal Council for Science and Technology; 1967 annual report. July 1968. Washington, U.S. Govt. Print. Off., 1968, 43 p.
- Federal Council for Science and Technology; 1968 annual report. June 1969. Washington, U.S. Govt. Print. Off., 1969, 32 p.
- Federal Council for Science and Technology; 1969 annual report. Washington, U.S. Govt. Print. Off., 1970, 29 p.
- Report on the Federal R&D program, FY 1976. Washington, U.S. Govt. Print. Off., 1975. 165 p. [Short description of the Federal Council for Science and Technology and its committees at pp. 161-165.]

JOINT REPORTS

- U.S. Federal Council for Science and Technology and American Council on Education. Proceedings, symposium on education and Federal laboratory-university relationships, October 29-31, 1968. May 1969. Washington, U.S. Govt. Print. Off., 1969. 251 p.
- U.S. Federal Council for Science and Technology and Council on Environmental Quality. The role of ecology in the Federal Government; report of the Committee on Ecological Research. December 1974. Washington, U.S. Govt. Print. Off., 1975. 78 p. NSF 75-401.
- Fluorocarbons and the environment; report of Federal task force on inadvertent modification of the stratosphere (IMOS). June 1975. Washington, U.S. Govt. Print. Off., 1975. 109 p. NSF 75-403.
- Further information on the fluorocarbon industry and on potential economic impacts of restriction of fluorocarbon production; analysis by Domestic and International Business Administration, Department of Commerce. [1975] 1 p. + attachment: Preliminary analysis of economic impacts of fluorocarbon restrictions on industry, by U.S. Department of Commerce, Assistant Secretary for Domestic and International Business. 12 p.
- Federal task force reports "Cause for Concern" about fluorocarbon damage to ozone shield. News release 75-FC3. June 12, 1975. 4 p.
- Interagency task force on inadvertent modification of the stratosphere (IMOS). Fact sheet. [June 12, 1975?] 11 p.
- U.S. Federal Council for Science and Technology. IMOS Subcommittee on Biological and Climatic Effects Research. A proposed Federal research program to determine the biological and climatic effects of stratospheric ozone reduction. Report of the . . . February 1976. DRAFT. 93 p. Processed.

STANDING COMMITTEE

U.S. Federal Council for Science and Technology. Standing Committee. The competition for quality. The effect of current salary levels on the Federal Government's ability to recruit and retain superior scientific and engineering personnel. A report by the Panel on Environment and Incentives for Research of the Standing Committee of the . . . January 1962. Washington, U.S. Govt. Print. Off., 1962, 48 p.

----- The competition for quality. Non-salary factors affecting the selection, recruitment, development, and retention of superior personnel in the scientific service of the Federal Government. A report by the Panel on Environment and Incentives for Research of the Standing Committee of the . . . April 1962. 20 p. Processed.

----- Proceedings, first symposium, current problems in the management of scientific personnel, October 17-18, 1963. [1964] 131 p.

----- Proceedings, second symposium, technical information and the Federal laboratory, April 13-14, 1964. [1964] 88 p.

----- Proceedings, third symposium, the environment of the Federal laboratory, December 7-8, 1964. Sponsored by Federal Council for Science and Technology and the Civil Service Commission. Published by the Museum of History and Technology, Smithsonian Institution, Washington, Washington, D.C. May 1965. 125 p.

----- Management and the marginal employee. March 1966.

----- The environment for quality, a report on the identification and evaluation of employment features important to the recruitment, retention, and effective utilization of superior scientists and engineers in the Federal service. December 1966, 21 p. Processed.

COMMITTEE ON ACADEMIC SCIENCE AND ENGINEERING

U.S. National Science Foundation. Federal support for academic science and other educational activities in universities and colleges, fiscal year 1965. Prepared by the National Science Foundation for the Office of Science and Technology. August 1966. 49 p. NSF 66-30.

First report compiled for the Committee on Academic Science and Engineering in compliance with the President's directive of September 13, 1965.

----- Federal support to universities and colleges, fiscal years 1963-66. Prepared by the National Science Foundation for the Office of Science and Technology. Washington, U.S. Govt. Print. Off., 1967. 137 p. NSF 67-14.

Second report compiled for Committee on Academic Science and Engineering.

----- Federal support to universities and colleges, fiscal year 1967. Prepared by the National Science Foundation for the Office of Science and Technology. Washington, U.S. Govt. Print. Off., 1969. 86 p. NSF 69-7.

Third in a series for Committee on Academic Science and Engineering.

----- Federal support to universities and colleges, fiscal year 1968. Prepared by the National Science Foundation for the Committee on Academic Science and Engineering of the Federal Council for Science and Technology. Washington, U.S. Govt. Print. Off., 1970. 89 p.

Fourth report in a series.

----- A report to the President and Congress; Federal support to universities, colleges, and selected nonprofit institutions, fiscal year 1969. Washington, U.S. Govt. Print. Off., 1970. 175 p.

Fifth annual report to Committee on Academic Science and Engineering; second annual report to Congress as required by the National Science Foundation Act of 1950, as amended.

----- Federal funds for academic science, fiscal year 1969. Washington, U.S. Govt. Print. Off., 1971. 80 p. NSF 71-7.

Compiled for Committee on Academic Science and Engineering.

----- A report to the President and Congress; Federal support to universities, colleges, and selected nonprofit institutions, fiscal year 1970. Washington, U.S. Govt. Print. Off., 1971. 105 p. NSF 71-28.

Sixth annual report to Committee on Academic Science and Engineering; third annual report to Congress under the National Science Foundation Act of 1950, as amended.

----- Federal funds for academic science, fiscal year 1970. Washington, U.S. Govt. Print. Off., 1971. 62 p. NSF 72-301.

Compiled for Committee on Academic Science and Engineering.

----- A report to the President and Congress; Federal support to universities, colleges, and selected nonprofit institutions, fiscal year 1971. Washington, U.S. Govt. Print. Off., 1973. 122 p. NSF 73-300.

Seventh annual report to Committee on Academic Science and Engineering; fourth annual report to Congress under National Science Foundation Act of 1950, as amended.

U.S. Federal Council for Science and Technology. Committee on Academic Science and Engineering. Classification of agency programs with impact on institutional development. In U.S. Congress. House. Committee on Science and Astronautics. Subcommittee on Science, Research and Development. Institutional grants bill (H.R. 35). Hearings before the . . . 91st Congr. 1st sess. February 1969. Washington, U.S. Govt. Print. Off., 1969. At pp. 348-350.

Compiled by a Subcommittee of the Committee on Academic Science and Engineering in 1967 from information submitted by the member departments and agencies.

INTERDEPARTMENTAL COMMITTEE FOR ATMOSPHERIC SCIENCES

The following list contains the reports which have been published under ICAS cognizance since inception of the Committee:

- U. S. Federal Council for Science and Technology. Interdepartmental Committee for Atmospheric Sciences. Status report on atmospheric sciences in the Federal Government. ICAS Report No. 1. May 1960. 17 p.
- Further remarks on the atmospheric sciences in the Federal Government with special attention to certain promising areas. ICAS Report No. 2. July 1960. 8 p.
- Atmospheric sciences in the Federal Government: fiscal year 1962; with projections for fiscal year 1963 and remarks on some areas of program deficiency and special opportunity. ICAS Report No. 3. June 15, 1961. 20 p.
- The atmospheric sciences, 1961-1971. Federal Government comment on the report of the Committee on Atmospheric Sciences, National Academy of Sciences, entitled "The Atmospheric Sciences, 1961-1971." ICAS Report No. 4. October 17, 1961. 16 p.
- Selected program issues in the atmospheric sciences; a contribution to the 1962 spring review of science and technology in the Federal Government, Conducted by the Federal Council for Science and Technology. ICAS Report No. 5. May 29, 1962. 9 p.
- National atmospheric sciences program: fiscal year 1964; with projections to fiscal year 1967. ICAS Report No. 6. September 5, 1962. 32 p. (A supplement to ICAS Report No. 6, containing revised agency program plans and fiscal data, was distributed November 7, 1962.)
- Spring preview of the Federal atmospheric sciences program: fiscal year 1965; with projections through fiscal year 1968. ICAS Report No. 7. May 28, 1963. 25 p.
- National atmospheric sciences program: fiscal year 1965. ICAS Report No. 8. October 16, 1963. 45 p. (A supplement to ICAS Report No. 8, containing revised agency program descriptions and fiscal data, was distributed February 4, 1964.)
- National atmospheric sciences program: fiscal year 1966. ICAS Report No. 9. October 16, 1964. 55 p.
- National atmospheric sciences program: fiscal year 1967. ICAS Report No. 10. January 1966. 48 p.
- Newell, Homer E. A recommended national program in weather modification. Federal Council for Science and Technology, Interdepartmental Committee for Atmospheric Sciences. ICAS Report No. 10a. November 1966. 93 p.
- U. S. Federal Council for Science and Technology. Interdepartmental Committee for Atmospheric Sciences. National atmospheric sciences program: fiscal year 1968. ICAS Report No. 11, January 1967. 53 p.

- National atmospheric sciences program: fiscal year 1969. ICAS Report No. 12. January 1968. 62 p.
 - National atmospheric sciences program: fiscal year 1970. ICAS Report No. 13. January 1969. 64 p.
 - National atmospheric sciences program: fiscal year 1971. ICAS Report No. 14. January 1970. 66 p.
 - National atmospheric sciences program: fiscal year 1972. ICAS Report No. 15. March 1971. 77 p.
 - A national program for accelerating progress in weather modification. ICAS Report No. 15a. June 1971. 50 p.
 - National atmospheric sciences program: fiscal year 1973. ICAS 16 -- FY73. May 1972. 111 p.
 - National atmospheric sciences program: fiscal year 1974. ICAS 17 -- FY74. May 1973. 100 p.
 - National atmospheric sciences program: fiscal year 1975. ICAS 18 -- FY75. May 1974. 95 p. NSF 74-400.
 - Report of the Ad Hoc Panel on the Present Interglacial. ICAS 18b -- FY 75. August 1974. 22 p. NSF 74-402.
 - The possible impact of fluorocarbons and halocarbons on ozone. ICAS 18a -- FY75. Washington, U. S. Govt. Print. Off., May 1975. 75 p. NSF 75-404.
- Kuzmack, Richard A. (study director) The capital structure supporting atmospheric research. Center for Naval Analyses, CNS 1052, Arlington, Va., January 1975. (by Richard A. Kuzmack, Anne S. Jondrow, James E. Koehr, Susan E. Bender, and Robert F. Hale) 53 p.
- U.S. Federal Council for Science and Technology. Interdepartmental Committee for Atmospheric Sciences. National atmospheric sciences program: fiscal year 1976. ICAS 19 -- FY76. May 1975. 82 p. NSF 76-405.
- U.S. Council on Environmental Quality and Federal Council for Science and Technology. Interagency Task Force in Inadvertent Modification of the Stratosphere. Report by the Interdepartmental Committee for Atmospheric Sciences (ICAS): Potential hazards to the stratosphere posed by substances other than fluorocarbons. Washington, U.S. Govt. Print. Off., February 1976.
- U.S. Federal Council for Science and Technology. National atmospheric sciences program: fiscal year 1977. ICAS 20 -- FY77. May 1976. 103 p. NSF 76-402.

Reports in Preparation

The following reports have been undertaken by the ICAS and are in some stage of preparation or final review:

National climate program plan

National plan for upper atmosphere research

INTERAGENCY ARCTIC RESEARCH COORDINATING COMMITTEE

U.S. Federal Council for Science and Technology. Interagency Arctic Research Coordinating Committee. Arctic bulletin No. 3 (FY 1973 Report of the IARCC).

----- Arctic bulletin No. 4.

----- Arctic bulletin No. 5.

----- Arctic bulletin No. 6 (FY 1974 Report of the IARCC).

----- Arctic bulletin No. 7.

----- Arctic bulletin No. 8 (Volume 2) 1976.

----- Federal research in the Arctic (brochure).

Opportunities for permafrost-related research associated with the Trans-Alaska pipeline system. Report of workshop March 19-22, 1975, Scottsdale, Arizona. Committee on Permafrost, Polar Research Board; Assembly of Mathematical and Physical Sciences, National Research Council. Published by the National Academy of Sciences, Washington, D.C. 1975 for IARCC. 37 p.

(All of these reports are available from the National Science Foundation, Office of Polar Programs.)

INTERAGENCY COORDINATING COMMITTEE FOR ASTRONOMY

Report in Preparation

U.S. Federal Council for Science and Technology. Interagency Coordinating Committee for Astronomy. Solar Astronomy Task Force. Report.

COMMITTEE ON AUTOMATION OPPORTUNITIES IN THE SERVICE AREAS

- U.S. Federal Council for Science and Technology. Committee on Automation Opportunities in the Service Areas. Automation opportunities in the service sector; report of the . . . May 1975. NSF 75-400. 112 p. [Distributed by Ad Hoc Committee on Domestic Technology Transfer and the National Bureau of Standards]

AD HOC COMMITTEE ON DOMESTIC TECHNOLOGY TRANSFER

- U.S. Federal Council for Science and Technology. Committee on Domestic Technology Transfer. Directory of Federal technology transfer. Washington, U.S. Govt. Print. Off., 1975. 202 p.
- U.S. National Science Foundation. Office of National R&D Assessment. Federal technology transfer; an analysis of current program characteristics and practices. A report prepared for the Committee on Domestic Technology Transfer, Federal Council for Science and Technology by . . . December 1975. 38 p. NSF 76-400.
- Federal technology transfer; an analysis of current program characteristics and practices. Executive summary. Prepared for the Committee on Domestic Technology Transfer, Federal Council for Science and Technology by . . . December 1975. 8 p. NSF 76-401.

AD HOC INTERAGENCY WORKING GROUP FOR EARTHQUAKE RESEARCH

- U.S. Federal Council for Science and Technology. Ad Hoc Interagency Working Group for Earthquake Research. Proposal for a ten-year national earthquake hazards program; a partnership of science and the community. Prepared for the Office of Science and Technology and the Federal Council for Science and Technology. Washington, 1968 [i.e., 1969], 81 p. NTIS PB 180 529.

COMMITTEE ON ENERGY RESEARCH AND DEVELOPMENT GOALS

- U.S. Federal Council for Science and Technology. Committee on Energy Research and Development Goals. Reference energy systems and resource data for use in the assessment of energy technologies. Report by Associated Universities, Inc. AET-8, April 1972. NTIS PB 221 422.
- Extraction of energy fuels. Report prepared by the Extraction of Energy Fuels Panel for the . . . June 1972. NTIS PB 220 328.
 - Assessment of geothermal energy resources. Report prepared by the Panel on Geothermal Energy Resources, Dallas L. Peck, Coordinator. June 1972. NTIS PB 224 882.
 - Report of Technical Group on Electric Transmission and Systems, F.F. Parry, Chairman. July 14, 1972. NTIS PB 224 881.
 - Research and development opportunities for improved transportation energy usage. Summary technical report of the Transportation Energy Panel. July 14, 1972. NTIS PB 224 880.
 - Energy research and development opportunities for heavy-duty transportation. Report of the Heavy-Duty Transportation Subpanel of the Transportation Energy Panel. July 16, 1972. NTIS PB 224 883.
 - Total energy systems, urban systems, residential energy consumption. Report of the HUD Subpanel. Aug. 3, 1972. NTIS PB 221 374.
 - Hydrogen and other synthetic fuels. Report prepared for the OST/FCST Committee on Energy R&D Goals under the cognizance of the U.S. Atomic Energy Commission. Sept. 1972. NTIS PB 224 482.
 - An evaluation of the gas cooled fast reactor. Sept. 1972. NTIS PB 224 479.
 - An evaluation of the molten salt breeder reactor. Sept. 1972. NTIS PB 224 478.
 - An assessment of solar energy as a national energy resource. Report prepared by the NSF/NASA Solar Energy Panel, P. Donovan, W. Woodward, co-chairman. December 1972. NTIS PB 221 659.
 - Report of Panel on Advanced Cycle Central Station Power Plants, Neal P. Cochran, Executive Secretary. NTIS PB 224 879.
 - Fusion power: an assessment of ultimate potential and research and development requirements. Report prepared by a committee sponsored by the USAEC Division of Controlled Thermonuclear Research, Robert L. Hirsch, Chairman. NTIS PB 224 480.
 - Clean fuels from coal. NTIS PB 224 530.

U.S. Office of Science and Technology. Energy Advisory Panel. An assessment of new options in energy research and development. A report of a study organized by the Office of Science and Technology with the participation of the Federal Council for Science and Technology and with partial support from the National Science Foundation. AET-9. November 1973. 290 p. NTIS PB 229 725.

COMMITTEE ON ENVIRONMENTAL QUALITY

U.S. Federal Council for Science and Technology. Committee on Environmental Quality. Fiscal year 1967 and 1968 Federal expenditures on research, development, and demonstration related to pollution, May 1968. 15 p. Processed.

----- Noise -- Sound Without Value, September 1968.

----- Systematic biology, a survey of Federal programs and needs. Prepared by the Panel on Systematics and Taxonomy, May 1969. December 22, 1969. Washington, U.S. Govt. Print. Off., 1969.

AD HOC COMMITTEE ON ENVIRONMENTAL QUALITY RESEARCH AND DEVELOPMENT

U.S. Office of Science and Technology. Environmental quality research and development; a review and analysis of Federal programs. Report of Ad Hoc Committee on Environmental Quality Research and Development of the Federal Council for Science and Technology. Washington, U.S. Govt. Print. Off., August 1971. 137 p.

INTERAGENCY COMMITTEE ON EXCAVATION TECHNOLOGY

U.S. Federal Council for Science and Technology. Interagency Committee on Excavation Technology. Federal excavation technology program; 1971 annual report. April 1972.

----- Federal excavation technology program; 1972-1973 report. January 1975. Washington, U.S. Govt. Print. Off., 1975. 30 p. NSF 75-400.

COMMITTEE ON FEDERAL LABORATORIES

U.S. Federal Council for Science and Technology. Committee on Federal Laboratories. Education and the Federal laboratories; an assessment of Federal laboratory educational activities and their present and potential relationships with universities. March 1968. 90 p.

----- Special Task Force of the Committee on Federal Laboratories. Catalog of Federal laboratory-university programs and relationships; report to the Federal Council for Science and Technology, Committee on Federal Laboratories. August 1969. Published by OST. Washington, U.S. Govt. Print. Off., 1969. 76 p.

----- Proceedings, symposium on education and Federal laboratory-university relationships, held October 29-31, 1968. May 1969. (Sponsored jointly by the FCST and the American Council on Education.) June 1969. Washington, U.S. Govt. Print. Off., 1969.

----- Directory of Federal R&D installations for the year ending June 30, 1969. Prepared by the National Science Foundation at the request of the Chairmen, FCST, and with the assistance of a COFL advisory group. June 1970. Washington, U.S. Govt. Print. Off., 1044 p. NSF 70-23.

----- Performance measures for research and development, Vol. I and II. May 1973.

----- Measuring and enhancing productivity in the Federal Government. October 1973.

----- Intergovernmental use of Federal R&D laboratories. March 1974. Washington, U.S. Govt. Print. Off., 1974. 30 p. NSF 74-401.

----- Workshop on the management of research and development. May 1975.

Reports in Preparation

----- Environment and staffing in the Federal laboratories. [1976]

TECHNICAL COMMITTEE ON HIGH ENERGY PHYSICS

U.S. Federal Council for Science and Technology. Technical Committee on High Energy Physics. A ten-year preview of high energy physics. Prepared by a Subcommittee of the Technical Committee . . . December 12, 1960.

COMMITTEE ON INTERGOVERNMENTAL SCIENCE RELATIONS

U.S. Federal Council for Science and Technology. Committee on Intergovernmental Science Relations. Public technology; a tool for solving national problems. Report of the . . . to the . . . May 1972. Washington, U.S. Govt. Print. Off., 1972, 60 p.

----- Meeting of the Committee on Intergovernmental Science Relations of the Federal Council for Science and Technology with the Georgia Science and Technology Commission, November 13, 1969.

INTERNATIONAL COMMITTEE

U.S. Federal Council for Science and Technology. International Committee. International scientific and technological activities. Report of the . . . (June 20, 1961). In U.S. Congress. House. Committee on Government Operations. Federal foreign research spending and the dollar drain. Hearings before a Subcommittee of the . . . 89th Congress 2d session. February 10 and 24, 1966. Washington, U.S. Govt. Print. Off., 1966. 216 p. At pp. 173-184.

----- Policy guidance for research investment abroad by U.S. agencies. Statement by the . . . In U.S. Congress. House. Committee on Government Operations. Federal foreign research spending and the dollar drain. Hearings before a Subcommittee of the . . . 89th Congress 2d session. February 10 and 24, 1966. Washington, U.S. Govt. Print. Off., 1966. 216 p. At pp. 123-126.

U.S. Department of State. Bureau of International Scientific and Technological Affairs. International scientific cooperation; a summary of tangible benefits. [Prepared by the International Committee.] Washington, U.S. Govt. Print. Off., 1974. 12 p. Department of State Publ. 8760.

AD HOC COMMITTEE ON THE INTERNATIONAL GEODYNAMICS PROJECT

[No reports were issued in 1974 or 1975.]

First annual report of Ad Hoc Committee on Geodynamics to the Federal Council for Science and Technology. June 1976. 43 p. NSF 76-403.

INTERAGENCY COMMITTEE ON MARINE SCIENCE AND ENGINEERING

The following list contains the reports which have been published under the cognizance of the ICMSE and those to which the ICMSE contributed significantly in preparation:

U.S. Office of Science and Technology. The Federal ocean program; the annual report of the President to the Congress on the Nation's effort to comprehend, conserve, and use the sea. Washington, U.S. Govt. Print. Off., April 1972. 121 p.

----- The Federal ocean program; the annual report of the President to the Congress on the Nation's efforts to comprehend, conserve, and use the sea. Washington, U.S. Govt. Print. Off., April 1973. 133 p.

U.S. National Science Foundation. Science and Technology Policy Office. The Federal ocean program; the annual report of the President to the Congress on the Nation's efforts to comprehend, conserve, and use the sea. Washington, U.S. Govt. Print. Off., April 1974. 151 p.

U.S. Federal Council for Science and Technology. Interagency Committee on Marine Science and Engineering. Proceedings of the First Federal Conference on the Great Lakes (December 13, 14, 15, 1972). Prepared for ICSME by the Environmental Protection Agency under agreement with the Great Lakes Basin Commission (no publication date). 334 p.

----- Marine research, 1973; a catalog of unclassified marine research activities sponsored by Federal and non-Federal organizations. Washington, U.S. Govt. Print. Off., October 1973. 1175 p.

----- Manned undersea activities of the Federal agencies and utilization of manned undersea research submersibles and habitats, December 1972. Washington, U.S. Govt. Print. Off., April 1974. 51 p.

----- Ocean instrumentation. Prepared for ICMSE in response to a request from the U.S. Senate National Ocean Policy Study by the National Oceanic and Atmospheric Administration. November 1974. 106 p.

U.S. Congress. Senate. Committee on Commerce. National ocean policy study. Ocean data resources. Washington, U.S. Govt. Print. Off., March 1975. 60 p. [at head of title: 94th Congress 1st session. Committee print.]

Hale, Robert F. (study director) The capital structure for ocean science: final report of the ocean science and technology resources study (CRS). (by Robert F. Hale, Anne S. Jondrow, James E. Koehr, Susan E. Bender, and Richard A. Kuzmack) Arlington, Va., Center for Naval Analyses, March 1975. CNS 1048. 77 p.

U.S. Federal Council for Science and Technology. Interagency Committee on Marine Science and Engineering. The capital structure for ocean science, 1975. April 17, 1975. 89 p. (The Center for Naval Analyses report on the same subject is included as Appendix B of this report.)

- Federal water-related research, development, and management programs in the Great Lakes region. Prepared by ICMSE in response to request from the U.S. Senate National Ocean Policy Study. Washington, October 1975. 188 p.
- Mapping, charting, and geodesy; new products, 1974. Washington, November 1975. 29 p.
- Great Lakes directory of universities, research institutes, libraries, and agencies concerned with water and land resources in the Great Lakes Basin, 1976. (by Ellen M. Prosser, Gretchen R. Sorsen, M. Annette Ketner, Martha W. Deline, and Sandra Baseman) Prepared for ICMSE by the Great Lakes Environmental Laboratory of the National Oceanic and Atmospheric Administration under contract with the Great Lakes Basin Commission, Ann Arbor, Michigan, March 1976. 66 p.
- University curricula in the marine sciences and related fields; academic years 1973-1974, 1974-1975 revised. Prepared for ICMSE by the Office of Sea Grant under contract to Jacobson/Wallace, Inc. New York (no publication date). 176 p.
- University curricula in the marine sciences and related fields; academic years 1975-1976, 1976-1977. Prepared for ICMSE by the Office of Sea Grant under contract to Kaufman DeDell Printing, Inc., Syracuse, N.Y. (no publication date). 226 p.

Reports in Preparation

The following reports, sponsored by the ICMSE or to which the ICMSE has contributed significantly, are in some stage of preparation:

The Federal ocean program, 1975.

The Federal ocean program, 1976.

Manned undersea activities of the Federal agencies and utilization of manned undersea research submersibles and habitats, April 1975.

Proceedings of the Second Federal Conference on the Great Lakes.

Survey of institutions concerned with the water and related resources in the Chesapeake Bay basin.

Opportunities in oceanography.

COMMITTEE ON MATERIALS

U.S. Federal Council for Science and Technology. Committee on Materials. Phase I report: Inventory and analysis of materials life cycle research and development in the Federal Government --fiscal year 1976. COMAT Task Force 1 for the Committee on Materials of the FCST. Prepared with assistance of Battelle's Columbus Laboratories under contract to Bureau of Mines, Department of the Interior. April 1976. 25 p. + appendices A-G.

-----COMAT Report 76/1. August 1976: Environmental aspects of federally sponsored, materials-related research and development, fiscal year 1976. Prepared by COMAT Task Force 3 for the Committee on Materials. August 1976. 41 p. + appendices A-G.

-----ERDA 76-28V1 (Prel. version) A Federal look at the needs for energy-related materials research and development. Vol. 1: Near-term energy program. Prepared by the Energy Task Group. Published by ERDA Technical Information Center. Oak Ridge, Tenn. [1976] 108 p.

COORDINATING COMMITTEE FOR MATERIALS RESEARCH AND DEVELOPMENT

U.S. Federal Council for Science and Technology. Coordinating Committee for Materials Research and Development. Problems deserving further study. November 3, 1961. In U.S. Congress. Joint Committee on Defense Production. Eleventh annual report. 87th Cong. 2d sess. Washington, U.S. Govt. Print. Off., 1961, 405 p. At pp. 35-40.

----- CCMRD survey on titanium sheet rolling program; refractory metal sheet program; National Standard Reference Data System; and the university interdisciplinary laboratory program. In U.S. Congress. Joint Committee on Defense Production. Fourteenth annual report. 89th Cong. 1st sess. H. Rept. 1. January 1965. Washington, U.S. Govt. Print. Off., 1965, 467 p. At pp. 11-23.

----- Federal materials research program -- opportunities, roadblocks and problems. November 1965 (TID-22424).

National Research Council. Solid State Sciences Panel. Research in solid-state sciences: opportunities and relevance to national needs; a report prepared by a Committee of the Solid States Sciences Panel for the Coordinating Committee for Materials Research and Development. Washington, National Academy of Sciences. 1968. 103 p.

COMMITTEE ON NATURAL RESOURCES

U.S. Federal Council for Science and Technology. Committee on Natural Resources. Report of the Committee on Natural Resources. January 25, 1963.

----- Research and development on natural resources; report. Washington, U.S. Govt. Print. Off., May 1963, 134 p. (Pub. No. 1)

INTERAGENCY COMMITTEE ON OCEANOGRAPHY*

- U.S. Federal Council for Science and Technology. Interagency Committee on Oceanography. Oceanographic ship operating schedule, FY 1962. Washington, U.S. Govt. Print. Off., March 1961. ICO Pub. No. 1.
- National oceanographic program, FY 1962. Washington, U.S. Govt. Print. Off., March 1961. ICO Pub. No. 2.
- National oceanographic program, FY 1963. Washington, U.S. Govt. Print. Off., May 1962. ICO Pub. No. 3.
- Oceanographic ship operating schedule, FY 1963. Washington, U.S. Govt. Print. Off., May 1962. ICO Pub. No. 4.
- Oceanographic research in the Federal Government. Washington, U.S. Govt. Print. Off., June 1962. ICO Pub. No. 5.
- University curricula in oceanography 1962-63. Washington, U.S. Govt. Print. Off., June 1962. ICO Pub. No. 6.
- National plan for ocean-wide surveys. Washington, U.S. Govt. Print. Off., May 1963, 47 p. ICO Pub. No. 7.
- Opportunities in oceanography. Washington, U.S. Govt. Print. Off., July 1964. ICO Pub. No. 8.
- Bibliography of oceanographic publications. Washington, U.S. Govt. Print. Off., April 1963. ICO Pub. No. 9.
- Long range national oceanographic plan (1963-1972). Washington, U.S. Govt. Print. Off., June 1963, 58 p. ICO Pub. No. 10.
- National oceanographic program, FY 1964. Washington, U.S. Govt. Print. Off., April 1963, 67 p. ICO Pub. No. 11.
- Oceanographic ship operating schedule, FY 1964. Washington, U.S. Govt. Print. Off., May 1963. ICO Pub. No. 12.
- University curricula in oceanography 1963-64. Washington, U.S. Govt. Print. Off., June 1963. ICO Pub. No. 14.
- National oceanographic program, FY 1965. Washington, U.S. Govt. Print. Off., March 1964, 50 p. ICO Pub. No. 15.
- Oceanographic ship operating schedule, FY 1965. Washington, U.S. Govt. Print. Off., May 1964. ICO Pub. No. 16.
- National oceanographic program FY 1966. Washington, U.S. Govt. Print. Off., January 1965, 73 p. ICO Pub. No. 17.

*ICO Publications numbered 13, 26, 28 and 29 were canceled.

- Undersea vehicles for oceanography. Washington, U.S. Govt. Print. Off., December 1965, 81 p. ICO Pub. No. 18.
- Oceanographic research in the Federal Government. Washington, U.S. Govt. Print. Off., September 1966. ICO Pub. No. 19.
- Bibliography of marine sciences publications and reports (1962-1964). Washington, U.S. Govt. Print. Off., September 1966. ICO Pub. No. 20.
- Scientific and technical personnel in oceanography in the United States. Washington, U.S. Govt. Print. Off., November 1965, 48 p. ICO Pub. No. 21.
- Oceanographic ship operating schedule, FY 1966. Washington, U.S. Govt. Print. Off., May 1965. ICO Pub. No. 22.
- University curricula in oceanography, academic year 1965-66. Washington, U.S. Govt. Print. Off., December 1965. ICO Pub. No. 23.
- National oceanographic program, FY 1967. Washington, U.S. Govt. Print. Off., March 1966, 107 p. ICO Pub. No. 24.
- U.S. oceanic research in foreign waters. Washington, U.S. Govt. Print. Off., January 1966, 20 p. ICO Pub. No. 25.
- Oceanographic ship operating schedule, FY 1967. Washington, U.S. Govt. Print. Off., July 1966. ICO Pub. No. 27.
- University curricula in the marine sciences academic year 1967-68. Washington, U.S. Govt. Print. Off., August 1967, 157 p. ICO Pub. No. 30.
- Oceanographic ship operating schedule, FY 1968. Washington, U.S. Govt. Print. Off., July 1967. ICO Pub. No. 31.

PATENT ADVISORY PANEL AND COMMITTEE ON
GOVERNMENT PATENT POLICY

- U.S. Federal Council for Science and Technology. Patent Advisory Panel. Annual report on Government patent policy. June 1965. [Prepared in consultation with Justice Department as required by sec. 3 of Statement on Government patent policy, issued by President of United States, Oct. 10, 1963] 1965. 47p.
- Patent Advisory Panel progress report to the Federal Council for Science and Technology. June 1964. Washington, U.S. Govt. Print. Off., 1964, 38 p.
- Annual report on Government patent policy, June 1966. Washington, U.S. Govt. Print. Off., 1966, 56 p.
- Committee on Government Patent Policy and Patent Advisory Panel. Annual report on Government patent policy, June 1967. June 1968. Washington, U.S. Govt. Print. Off., 1968, 64 p.
- Committee on Government Patent Policy. Government patent policy study, final report, Volume I. Prepared for the FCST Committee on Government Patent Policy by Harbridge House, Inc., May 1968. Washington, U.S. Govt. Print. Off., 1968.
- Government patent policy study, final report, Volumes II-IV, by Harbridge House, Inc., Boston, Mass., for the FCST Committee on Government Patent Policy, May 1968. January 1969.
- Annual report on Government patent policy, Dec. 1968. Washington, U.S. Govt. Print. Off., 1970, 83 p.
- Annual report on Government patent policy, combined Dec. 1969 and Dec. 1970. Washington, U.S. Govt. Print. Off., 1971, 160 p.
- Annual report on Government patent policy, combined Dec. 1971 and Dec. 1972. Washington, U.S. Govt. Print. Off., 1974, 206 p.

Report in Preparation

- Annual report on Government patent policy, combined Dec. 1973 and Dec. 1974.

AD HOC GROUP ON POPULATION RESEARCH

- U.S. Federal Council for Science and Technology. Ad Hoc Group on Population Research. The Federal program in population research. Washington, U.S. Govt. Print. Off., 1968/69. 115 p.

COMMITTEE ON SCIENTIFIC INFORMATION;
COMMITTEE ON SCIENTIFIC AND TECHNICAL INFORMATION

- U.S. Federal Council for Science and Technology. Committee on Scientific Information. Status report on scientific and technical information in the Federal Government. June 18, 1963. [1963] 18 p. NTIS PB 181 541.
- Standard for descriptive cataloging of Government scientific and technical reports, December 1963.
- Outline scope of activities of Committee on Scientific and Technical Information. Supplement No. 2. Committee on Scientific Information, January 1964.
- Second symposium on technical information and the Federal laboratory. Proceedings. Federal Council for Science and Technology, April 13-14, 1964. Washington, U.S. Govt. Print. Off., 1964. 88 p.
- U.S. Federal Council for Science and Technology. Committee on Scientific and Technical Information. Summary progress report, September 1964. In U.S. Congress. House. Select Committee on Government Research. Study No. IV. Documentation and dissemination of research and development results. Report of the . . . Washington, U.S. Govt. Print. Off., 1964. 148 p. At Appendix A, pp. 101-06. (88th Congress, 2d session. House. Report no. 88-1932.)
- COSATI subject category list. COSATI Panel on Operational Techniques and Systems, Dec. 1964, 55 p. NTIS AD 612 200.
- Special analysis of the President's FY 1966 budget for scientific and technical information programs of Federal government agencies. Washington, D. C. 1964. 31 p.
- Progress of the United States Government in scientific and technical communications. 1965 annual report. NTIS PB 173 510. 1965. 42 p.
- COSATI Panel on Information Sciences Technology. First report, September 1965. (Working Paper) NTIS PB 169 686.
- Federal microfiche standards, September 1965. NTIS PB 168 630.
- Recommendations for National Document Handling Systems in Science and Technology. System Development Corporation, Santa Monica, Calif. Nov. 1965, 3 v. Prepared for COSATI Task Group on National Systems for Scientific and Technical Information. Also published, in modified form, as National Document-Handling Systems for Science and Technology. Launor F. Carter, et al., New York, John Wiley & Sons 1967.

- Progress of the United States Government in scientific and technical communications. 1966 annual report. NTIS PB 176 535.
- Standard for descriptive cataloging of Government scientific and technical reports. Rev. No. 1, October 1966. COSATI Panel on Operational Techniques and Systems. 54 p. NTIS PB 173 314.
- A system study of abstracting and indexing in the United States. System Development Corporation, Falls Church, Va., December 16, 1966. Prepared for COSATI Task Group on National Systems for Scientific and Technical Information. 235 p. NTIS PB 174 249.
- Progress of the United States Government in scientific and technical communications. 1967 annual report. NTIS PB 180 867. 1967. 99 p.
- Specifications for the transfer of bibliographic information by magnetic tape (Working paper available from COSATI for research). 1967.
- Guidelines for the development of information retrieval thesauri. September 1967. Washington, U.S. Govt. Print. Off., 1967, 9 p.
- A review of a number of problems in scientific and technical information, (Working paper available from COSATI for research). 1967.
- An experimental bank of information pertaining to Federal agency information sciences technology research projects (Computerized data bank, available to participating Federal agencies for search purposes.) 1967.
- The copyright law as it relates to national information systems and national problems. COSATI Task Group on Legal Aspects of Information Systems. July 1967, 82 p. NTIS PB 175 618.
- Exploration of oral/informal technical communications behavior. August 1967. By American Institutes for Research for COSATI Task Group on National Systems for Scientific and Technical Information. 164 p. NTIS AD 650 219.
- Scientific and technical information programs of Federal agencies. Washington, D.C. 1968.
- Selected mechanized scientific and technical information systems. Prepared for the Panel on Operational Techniques and Systems by Herner and Company. Washington, D.C. April 1968. 143 p.
- Directory of Federally supported information analysis centers, April 1968, 196 p. NTIS PB 177 050.
- Proceedings of the forum of Federal supported information analysis centers, November 7-8, 1967. May 1968. 72 p. NTIS PB 177 051.
- Guidelines to format standards for scientific and technical reports prepared by or for the Federal Government, December 1968. 16 p. NTIS PB 180 600.

- The role of the technical report in scientific and technological communications. Prepared by the Task Group on the Role of the Technical Report, December 1968. February 1969. NTIS PB 180 944.
- A study of scientific and technical data activities in the United States, by Science Communication, Inc., for the COSATI Task Group on National Systems for Scientific and Technical Information, April 1968. Volume I-II. April 1969. NTIS AD 670 606 - AD 670 608.
- A survey of five on-line retrieval systems, by Mitre Corporation, for COSATI Panel on Information Sciences Technology, August 1968. May 1969. 59 p. AD 686 812.
- COSATI inventory of information science technology, 1968. Information General Corp., COSATI Panel on Information Sciences Technology. NTIS PB 188 880. May 1969. 2200 p. [Microfiche edition of the inventory published in 1968]
- Microfiche 1969 -- A user study, by Harold Wooster, Director of Information Sciences, Air Force Office of Scientific Research. July 1969. 176 p. NTIS AD 695 049.
- Ad Hoc Group on Data Centers. Report. Goddard Space Flight Center. NTIS PB 195 523. Sept. 1969. 20 p.
- The information analysis center. COSATI Panel on Information Analysis and Data Centers, October 1969, 42 p.
- Progress in scientific and technical communications, 1968 annual report. November 1969. 90 p. NTIS PB 186 400.
- Recommendations for improving the dissemination of Federal scientific and technical information. Report of the task group on dissemination of information. Washington, D.C. December 1969. 141 p.
- Progress in scientific and technical communications. 1969 annual report. NTIS PB 193 386. 1970. 156 p.
- Directory of Federally supported information analysis centers. Sponsored by Panel 6, Information Analysis and Data Centers. NTIS COSATI-70-1 PB 189 300. January 1970. 71 p.
- Compendium of terms in information science and technology. COSATI Panel on Information Sciences Technology. NTIS PB 193 346. April 1970. 474 p.
- Corporate author headings. COSATI Panel on Operational Techniques and Systems. NTIS PB 198 275. August 1970.
- Recommendations for improving the dissemination of Federal scientific and technical information. Report of the task group on dissemination of information. Washington, D.C. November 1970. 127 p.

- Conference on Federal information resources. Second conference. Proceedings, March 30-31, 1971. Washington, Federal City College Press, 1971. 102 pp. (Co-sponsored by the COSATI Panel on Library Programs, the Association of Research Libraries, the Federal Library Committee, and the U.S. Office of Education.)
- Progress in scientific and technical communications. Annual report for 1970. September, 1971. NTIS PB 202 448. 146 pp.
- Legal aspects of computerized information systems. 1972. NTIS PB 223 496.
- Management of information analysis centers. Proceedings of a Forum of COSATI. Jan. 1972. 203 p. Available at NTIS and ERIC.
- Making technical information more useful: The management of a vital national resource. A report for the Chairman of the FCST submitted via the Director of the National Science Foundation. June 1972. 61 p.
- Information systems law (jurisprudence, legal aspects of computerized information systems) v. 7, August 1973. 96 p. Available at NTIS.
- Review group, Martin Greenberger, chairman. Making technical information more useful; the management of a vital national resource. A report for the Chairman of the . . . submitted via the Director of the National Science Foundation. June 1972. In U.S. Congress. House. Committee on Science and Technology. The national science policy and organization act of 1975. Hearings . . . 94th Cong. 1st sess. Washington, U.S. Govt. Print. Off., 1975, 1041 p. At pp. 501-503. [Over-view only.]

AD HOC WORKING GROUP ON SOLID EARTH SCIENCES

- U.S. Federal Council for Science and Technology. Solid earth sciences; a preliminary assessment of status and outlook for Federal programs. Report of an Ad Hoc Working Group to the . . . July 1967. 59 p.

COMMITTEE ON WATER RESOURCES RESEARCH

- U.S. Federal Council for Science and Technology. Committee on Water Resources Research. Letter to Chairmen, Senate and House Appropriations Committees, from Dr. Jerome B. Wiesner, April 27, 1962, with "Tabulation of the Federal Effort in Water Investigation and Research, FY 1962 and FY 1963."
- Scientific hydrology. June 1962.
- Federal water resources research activities; memorandum of the chairman to the Committee on Interior and Insular Affairs, U.S. Senate, transmitting the report to the President on water resources research. Washington, U.S. Govt. Print. Off., 1963, 213 p. [Prepared by a task group of the Federal Council . . . Published also as committee print. Committee of Interior and Insular Affairs, U.S. Senate, Mar. 25, 1963]
- Federal water resources research program for fiscal year 1965. February 1964.
- Strengthening Federal water resources research by complementing in-house program with extramural research and education. April 10, 1964.
- Status report to the Federal Council for Science and Technology. May 28, 1964.
- Water resources research priority programs for fiscal year 1966. August 1964.
- Federal water resources research program for fiscal year 1966. A progress report of the Committee . . . February 1965. Washington, U.S. Govt. Print. Off., 1965, 10 p. (Pub. No. 3)
- A ten-year program of Federal water resources research. February 1966. Pub. No. 4. Washington, U.S. Govt. Print. Off., 1966, 88 p.
- U.S. President. Federal water resources research. The President's letter to the President of the Senate and the Speaker transmitting a report on a proposed 10-year program. March 19, 1966. Weekly Compilation of Presidential Documents, vol. 2, March 28, 1966, pp. 420-21.
- U.S. Federal Council for Science and Technology. Committee on Water Resources Research. Federal water resources research program for fiscal year 1967. A progress report of the Committee . . . April 1966. Washington, U.S. Govt. Print. Off., 1966, 20 p. (Pub. No. 5)
- U.S. Federal Council for Science and Technology. Committee on Water Resources Research. Federal water resources research program for FY 1968. April 1967. Washington, U.S. Govt. Print. Off., 1967. 28 p.

- Federal water resources research program for fiscal year 1969, August 1968. January 1969. 48 p.
- Water resources policy and political institutions, a report of panel on needed research, July 1968. Washington, U.S. Govt. Print. Off., Mar. 1969. 18 p.
- Federal water resources research program for fiscal year 1970. Dec. 1969.
- The effects and control of heated water discharges. Nov. 1970.
- Federal water resources research program for 1971.
- Federal water resources research program for 1973-1974. [August 1976.] 182 p. Published by the National Science Foundation.

Reports in Preparation

Determination of short- and long-range goals and objectives for the Nation's water resources research programs through a joint conference and workshop with the Department of the Interior. Conference date February 8 through 11, 1976. The proceedings will be published in 1976.

- Five year program of Federal water resources research, 1976-1980.

APPENDIX J
PRESIDENTIAL STATEMENTS
REFERRING TO THE
FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

COMPILED BY KAREN J. GUARISCO

SCIENCE POLICY ANALYST
SCIENCE POLICY RESEARCH DIVISION
CONGRESSIONAL RESEARCH INSTITUTE

APPENDIX J

PRESIDENTIAL STATEMENT UPON SIGNING ORDER ESTABLISHING FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY. MARCH 13, 1959¹

Less than twenty years ago, Federal support of science was about 100 million dollars annually. Today, this annual investment in research and development has grown to over five billion dollars, and a large fraction of these Federal funds is spent in laboratories owned and operated by private groups. It is the responsibility of the Federal Government to encourage in every appropriate way the scientific activities of non-Government institutions; but it is apparent from the size of these Federal expenditures that the policies and practices of the Federal Government can exert an immediate and substantial effect on the Nation's private scientific institutions as well as on Government laboratories.

I believe that the new Federal Council for Science and Technology can effectively aid the objective of improving the ways in which the Federal Government uses and supports science. Moreover, the report of my Science Advisory Committee on "Strengthening American Science" also pointed to a number of opportunities for advancing our total national program. I expect the new Council to consider and evaluate these opportunities and to encourage all Government agencies further to increase the quality of their efforts in these fields. By fostering greater cooperation among Federal agencies in planning their research and development programs, by facilitating the resolution of common problems, and by reviewing the impact of Government policies on the programs of non-Governmental institutions, the Council should be able to contribute greatly to the development and advancement of our national programs in these important and critical areas.

NOTE: Dr. Eisenhower's letter to the President, and a letter to Dr. Eisenhower from Secretary Herter relieving him of duty on the National Advisory Committee on Inter-American Affairs, were also released.

¹ U.S. President. (Dwight D. Eisenhower). Public papers of the Presidents, 1960. Washington, U.S. Govt. Print. Off., 1961, pp. 834-835.

"LETTER TO DR. MILTON S. EISENHOWER ON THE OCCASION OF HIS RESIGNATION FROM TWO ADVISORY COMMITTEES. *November 3, 1960*"¹

DEAR MILTON: With great reluctance, I am accepting your resignation as a member of the President's Advisory Committee on Government Organization, and am informing the Secretary of State that you wish to be relieved as a member of the National Advisory Committee on Inter-American Affairs.

NOTE: Executive Order 10807, establishing the Federal Council for Science and Technology, is published in the Federal Register (24 F.R. 1897).

The Science Advisory Committee report "Strengthening American Science" (Government Printing Office, 1958) was made public by the President on December 28, 1958, and is summarized in a note in the 1958 volume, this series, p. 869.

¹ U.S. President. (Dwight D. Eisenhower). Public papers of the Presidents, 1959. Washington, U.S. Govt. Print. Off., 1960, pp. 272-273.

I am delighted that, at the suggestion of the Department of the Navy and in accordance with our recent conversation, you will continue to serve on the Board of Visitors of the United States Naval Academy.

I know how difficult it has been for you, as President of the Johns Hopkins University, to give time to these important advisory committees, and additionally to serve as my personal representative on many major missions to Latin America. Your wisdom, experience, and common sense have time and again led to constructive recommendations for difficult problems. Your judgments and advice have been sound—practically, as well as morally.

Your work and concrete suggestions on government organization have been of substantial help in keeping the government abreast of changing requirements and in promoting economy and efficiency in government operations. You should take particular satisfaction from the fact that since 1953, fourteen reorganization plans have become effective, and seven other important reorganization measures have been put into operation by executive action. As a member of the Advisory Committee on Government Organization, you can take justifiable pride in having played an important role in the establishment of the Department of Health, Education and Welfare, the United States Information Agency, the International Cooperation Administration, the Federal Aviation Agency, the National Aeronautics and Space Agency, and Federal Council on Science and Technology.

Many ideas useful both to me and the Secretary of State have already come from the National Advisory Committee on Inter-American Affairs, which you first proposed in December, 1958, and your work in the area of Inter-American relations have been an inspiration to all people who believe that common problems can be resolved through mutual efforts.

In accepting your resignations from these two significant Advisory Committees, I want you to know that your counsel during the years I have occupied the Presidency has been a source of steady satisfaction to me personally. Your contribution to the cause of good government will be self-evident.

Sincerely,

DWIGHT D. EISENHOWER.

SPECIAL MESSAGE TO THE CONGRESS ON NATURAL RESOURCES.
FEBRUARY 23, 1961¹

TO THE CONGRESS OF THE UNITED STATES: From the beginning of civilization, every nation's basic wealth and progress has stemmed in large measure from its natural resources. This nation has been, and is now, especially fortunate in the blessings we have inherited. Our entire society rests upon—and is dependent upon—our water, our land, our forests, and our minerals. How we use these resources influences our health, security, economy, and well-being.

But if we fail to chart a proper course of conservation and development—if we fail to use these blessings prudently—we will be in trouble

¹ U.S. President, (John F. Kennedy). [Excerpted from] Special message to Congress on natural resources. Public papers of the Presidents, 1961. Washington, U.S. Govt. Print. Off., 1962, pp. 114–115.

within a short time. In the resource field, predictions of future use have been consistently understated. But even under conservative projections, we face a future of critical shortages and handicaps. By the year 2000, a United States population of 300 million—nearly doubled in 40 years—will need far greater supplies of farm products, timber, water, minerals, fuels, energy, and opportunities for outdoor recreation. Present projections tell us that our water use will double in the next 20 years; that we are harvesting our supply of high-grade timber more rapidly than the development of new growth; that too much of our fertile topsoil is being washed away; that our minerals are being exhausted at increasing rates; and that the Nation's remaining undeveloped areas of great natural beauty are being rapidly pre-empted for other uses.

Wise investment in a resource program today will return vast dividends tomorrow, and failures to act now may be opportunities lost forever. Our country has been generous with us in this regard—and we cannot now ignore her needs for future development.

This is not a matter of concern for only one section of the country. All those who fish and hunt, who build industrial centers, who need electricity to light their homes and lighten their burdens, who require water for home, industrial, and recreational purposes—in short, every citizen in every State of the Union—all have a stake in a sound resources program under the progressive principles of national leadership first forged by Pinchot and Theodore Roosevelt, and backed by the essential cooperation of State and local governments.

This statement is designed to bring together in one message the widely scattered resource policies of the Federal Government. In the past, these policies have overlapped and often conflicted. Funds were wasted on competing efforts. Widely differing standards were applied to measure the Federal contribution to similar projects. Funds and attention devoted to annual appropriations or immediate pressures diverted energies away from long-range planning for national economic growth. Fees and user charges wholly inconsistent with each other, with value received, and with public policy have been imposed at some Federal developments.

To coordinate all of these matters among the various agencies, I will shortly issue one or more Executive Orders or directives:

(1) Redefining these responsibilities within the Executive Office and authorizing a strengthened Council of Economic Advisers to report to the President, the Congress and the public on the status of resource programs in relation to national needs;

(2) Establishing, under the Council of Economic Advisers, a Presidential Advisory Committee on Natural Resources, representing the Federal agencies concerned in this area and seeking the advice of experts outside of government; and

(3) Instructing the Budget Director, in consultation with the Departments and agencies concerned, to formulate within the next 90 days general principles for the application of fees, permits and other user charges at all types of Federal natural resource projects or areas; and to reevaluate current standards for appraising the feasibility of water resource projects.

In addition, to provide a coordinated framework for our research programs in this area, and to chart the course for the wisest and most efficient use of the research talent and facilities we possess, I shall ask

the National Academy of Sciences to undertake a thorough and broadly based study and evaluation of the present state of research underlying the conservation, development, and use of natural resources, how they are formed, replenished and may be substituted for, and giving particular attention to needs for basic research and to projects that will provide a better basis for natural resources planning and policy formulation. Pending the recommendations of the Academy, I have directed my Science Advisor and the Federal Council for Science and Technology to review ongoing Federal research activities in the field of natural resources and to determine ways to strengthen the total government research effort relating to natural resources. . . .

* * *

STATEMENT BY THE PRESIDENT ANNOUNCING A CONTRACT FOR A
MATERIALS RESEARCH LABORATORY AT THE UNIVERSITY OF NORTH
CAROLINA. OCTOBER 12, 1961¹

Results of more specialized materials research in recent years have indeed had a revolutionary impact in a number of existing non-military technologies, that of the communications industry being a prime example. Application of new materials and processes has contributed greatly to the explosive growth of such vital new industries as electronic data processing and computers. They have also made feasible the development of essential hardware for unprecedented technical advances under extreme environmental conditions such as space exploration and new rocket components.

Recognizing that critical qualities of national programs in defense and space exploration would depend on strong reinforcement of national capabilities for materials research and development, the Defense Department, acting on the advice of the Federal Council for Science and Technology and the President's Science Advisory Committee, has already established eight interdisciplinary laboratories at universities. These new ventures in which the universities have undertaken to assemble faculties and students and to create advanced facilities, will for the first time combine modern progress in solid state physics, chemistry, metallurgy, mechanics, applied mathematics and other related fields. Accordingly, the programs will also train unprecedented numbers and kinds of materials specialists who have previously been offered higher education only specifically as metallurgists, solid state physicists, inorganic chemists, or experts in ceramics. Each of these new generations of students produced by the interdisciplinary laboratories will correspondingly have a broader competency in the challenging materials problems of the missile and space age than ever before.

NOTE: The statement was part of a White House release announcing a \$1 million contract between the University of North Carolina and the Advanced Research Projects Agency of the Department of Defense. The release also recorded the President as saying that the contract had been awarded to the university "in recognition of its notable faculty and student body. The State of North Carolina can well be proud of the accomplishments of this great university, the first State University in the land."

¹ U.S. President, (John F. Kennedy). Public papers of the Presidents, 1961. Washington, U.S. Govt. Print. Off., 1962, p. 665.

Three important additions are now being made to the eight laboratories previously established. The University of North Carolina, along with the University of Maryland and Purdue University, comprise these latest three. The University of North Carolina was one of the first in its geographical region and one of the first State universities to qualify for this new national strengthening of science, technology and education. A particular feature of the interdisciplinary materials research laboratory program is its full observance of the long-term qualities of basic research. Accordingly, the University of North Carolina has received, along with the others, a novel four year support commitment so that full values of the continuing nature of research and education can be properly combined in this new venture.

THE PRESIDENT'S NEWS CONFERENCE OF JANUARY 15, 1962¹

THE PRESIDENT. [I.] I have just one announcement. I am sure you are all familiar with the story in this morning's paper of the documentation* on the study of comparisons of those in our schools and universities and the kind of subjects which they study which was published by the National Science Foundation. This has been a matter of some concern to me for some time because one of the most critical problems facing this Nation is the inadequacy of the supply of scientific and technical manpower, to satisfy the expanding requirements of this country's research and development efforts in the near future. In 1951 our universities graduated 19,600 students in the physical sciences. In 1960 in spite of the substantial increase in our population, during the last 10 years, and in spite of the fact that the demand for people of skill in this field has tremendously increased with our efforts in defense and space, industrial research, and all of the rest, in 1960 the number had fallen from 19,600 to 17,100. In 1951 there were 22,500 studying in the biological sciences; in 1960 there were only 16,700. In the field of engineering, enrollment rose from 232,000 to 269,000 in the period 1951 to 1957. Since 1957 there has been a continual decline in enrollment. Last year the figure was down to 240,000.

This is a matter of growing concern. It is more than a matching of numerical supply to anticipate a demand, though this alone would be difficult. Because of the seriousness of this problem for the long-range future of the United States, I have asked my Science Advisory Committee, in cooperation with the Federal Council for Science and Technology, to review available studies and other pertinent information, and to report to me as quickly as possible on the specific measures that can be taken within and without the Government to develop the necessary and well qualified scientists and engineers and technicians to meet our society's complex needs—governmental, educational, and industrial. . . .

*

*

*

¹ U.S. President. (John F. Kennedy). [Excerpted from] The President's news conference of January 15, 1962. Public papers of the Presidents, 1962. Washington, U.S. Govt. Print. Off., 1963, pp. 15-16.

*Nicholas DeWitt. Education and professional employment in the USSR.

SPECIAL MESSAGE TO THE CONGRESS ON CONSERVATION.
MARCH 1, 1962¹

To the Congress of the United States: As our population expands, as our industrial output increases, and as rising productivity makes possible increased enjoyment of leisure time, the obligation to make the most efficient and beneficial use of our natural resources becomes correspondingly greater. The standard of living we enjoy—greater * * * proposals to facilitate the construction of pipelines to transport coal slurry in interstate commerce.

VII. POWER

One of the major challenges in resource conservation lies in the orderly development and efficient utilization of energy resources to meet the Nation's electric power needs—needs which double every decade. The goal of this Administration is to ensure an abundance of low cost power for all consumers—urban and rural, industrial and domestic. To achieve this, we must use more effectively all sources of fuel, find cheaper ways to harness nuclear energy, develop our hydroelectric potential, utilize presently unused heat produced by nature or as a by-product of industrial processes, and even capture the energy of the tides where feasible.

The ability to make long-range plans for the expansion of our Nation's electric power supply required by constantly growing power needs will be enhanced by a comprehensive nationwide survey to be undertaken by the Federal Power Commission. Under existing authority contained in the Federal Power Act, the Commission will project our national power needs for the 1970's and 1980's and suggest the broad outline of a fully interconnected system of power supply for the entire country. This information will encourage the electric power industry—both private and public—to develop individual expansion programs and intertie systems permitting all elements of the industry—and more importantly the consumers—to benefit from efficient, orderly planned growth. I urge favorable action on the request for adequate funds to initiate this study of the Nation's power needs for the next 20 years.

Advantageous arrangements and technological improvements for power generation and transmission are being developed by the Department of the Interior. Experimentation in extra high-voltage, direct-current transmission over long distances promises to enable us to send major blocks of low-cost off-peak electricity—that which is generated when the demand is low—as far as a thousand miles to areas where such energy can be put to higher and more valuable use because of their different patterns of electricity demands. Similarly, investigation is continuing on possibilities for using cheap off-peak power to pump water to storage reservoirs permitting the water to be used to generate power when demands are great and power sells at a premium.

VIII. RESEARCH AND TECHNOLOGY

Implicit in the conservation thesis of wise use, improvement, preservation and restoration of our resources is the basic requirement of greater scientific knowledge and improved resources management. The catalog of resource problems set forth in this message demonstrates the importance of intensive research in the resources field. In response to the demonstrated need for concentrated and coordinated research, this Administration has

—required the National Academy of Sciences to undertake a thorough evaluation of the potentials and needs for research underlying the development and use of natural resources.

—directed the Federal Council for Science and Technology to coordinate the wide-ranging research programs of participating agencies to strengthen and unify our total governmental research effort in the natural resources field.

—directed the Council of Economic Advisers to stimulate research in the economics of resource use.

Coordinated research programs already underway and worthy of special note are the following:

Oceanography—Our intensified effort to expand our knowledge and understanding of the vast resources held by the oceans through basic research and surveys of geologic and living resources will surely result in extending our known resource base, with . . .

* * *

MEMORANDUM ON REPORT "THE COMPETITION FOR QUALITY" BY THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY, MAY 13, 1962¹

MEMORANDUM TO DEPARTMENT AND AGENCY HEADS: The Federal Council for Science and Technology has transmitted to me a report entitled "The Competition for Quality" which sets forth steps urgently needed to assure competence within the Government establishment to carry out its program of scientific research and development. With the increasing importance of science and technology in developing our military defenses, in achieving our foreign policy objectives, and in sustaining the health and welfare of every citizen, the Federal Government must attract and retain its share of talented scientists and engineers at all levels.

The proposals I submitted to the Congress for pay reform which embody the principles of comparability with salaries in the private sector and internal adjustment to permit rewards for competence meet the recommendations contained in Part I of the report.

In Part II the Council suggests additional steps that should be taken to develop a more favorable environment for science within the Government. These are largely administrative in character. I am attaching

¹ U.S. President. (John F. Kennedy). [Excepted from] Special message to the Congress on conservation. Public papers of the President, 1962. Washington, U.S. Govt. Print. Off., 1963, pp. 176, 183.

this portion of the report. All practicable action should be taken to implement these recommendations. The Special Assistant to the President for Science and Technology will report to me from time to time as to the measures which have been taken.

JOHN F. KENNEDY.

STATEMENT BY THE PRESIDENT ON THE REPORT OF THE PRESIDENT'S SCIENCE ADVISORY COMMITTEE. "MEETING MANPOWER NEEDS IN SCIENCE AND TECHNOLOGY," DECEMBER 13, 1962¹

Earlier this year, I requested my Science Advisory Committee to examine the Nation's resources of scientific and technical personnel in relation to the demands being placed upon these resources—for military security, space exploration, economic progress, medical advancement, assistance to developing nations and education of future manpower. The Committee has now submitted the first in a series of reports. In it, the Committee states that this country faces an impending shortage of engineers, mathematicians, and physical scientists who combine high ability with graduate education. The Committee has made recommendations for immediate action.

The problem about which the Committee has expressed most concern is that diverse requirements for the more highly trained engineers, mathematicians, and physical scientists are rapidly outstripping our capability to produce them. To meet this problem, the Committee recommends a concerted program linking both Federal and private efforts to increase the number of those who have selected careers in these three fields to go on to graduate study. Because the program initially would extend training of students who are already in college, it has the advantage of meeting imminent shortages promptly.

The Committee's recommendations call first for augmented financial support of graduate students. Too many college graduates in the past have determined that they could not afford to continue on for advanced training. Many who have begun graduate study drop out prematurely because of financial difficulty.

The Committee also recommends increased funds to meet the universities' costs of training in these three fields so as not to divert funds from other fields of learning; funds to expand the physical plant at existing centers of educational excellence; but also funds to provide a wider geographical dispersion of such centers.

NOTE: The report was based on a study by a panel under the chairmanship of Dr. Allen v. Astin, Director of the National Bureau of Standards. Part I, dated January 1962 (48 pp. processed), deals with salaries; Part II, dated April 1962 (20 pp. processed), with non-salary factors affecting the selection and retention of superior personnel in the scientific service of the Federal Government.

Part II of the report urges that scientists and engineers be accorded greater participation in decision making and that Government laboratory directors be given more technical responsibility and administrative authority. Actions are also suggested for improving public information about the opportunities and challenges offered by science and technology in the public service and for developing within the Government short- and long-term career opportunities for scientists and engineers. Other recommendations deal with increasing the flexibility of working schedules, the need for more relocation assistance for transferred employees, and the desirability of governmentwide policy guidelines regarding official travel and attendance at scientific meetings.

¹ U.S. President, (John F. Kennedy). Public papers of the Presidents, 1962. Washington, U.S. Govt. Print. Off., 1963, pp. 392-393.

The Federal Council for Science and Technology has reported to me that it concurs with the Committee's analysis on the priority of this need. They also have confirmed the soundness of goals and feasibility of the proposed program to meet these goals.

I have requested that immediate consideration be given to this report in developing legislative and budget proposals which I shall submit to the Congress in January 1963.

Well-trained minds are among this Nation's most precious assets, among the scarcest of our resources. Attainment of our many national objectives and fulfillment of existing commitments critically depend on the quantity, and on the quality, of manpower in all professional fields, at all levels of training. Moreover, success in developing this Nation's necessary manpower resources requires a close relationship between the universities and the Federal Government, industry, private foundations and individuals, state and local governments. Sustained growth of excellence in American engineering and science will depend on the efforts of all.

It is the students themselves, however, who hold the key to this Nation's strength. It is my earnest hope that each college student will consider how valuable additional study will be in enhancing his abilities and potential contribution to the Nation, and in bringing him greater satisfaction and rewards.

JOHN F. KENNEDY.

NOTE: The statement, released in part on December 16 by the White House, was included as a foreword to the report entitled "Meeting Manpower Needs in Science and Technology—Report Number One: Graduate Training in Engineering, Mathematics, and Physical Science" (Government Printing Office, 1962). The report was prepared for the Science Advisory Committee by a Panel on Scientific and Technical Manpower under the chairmanship of Dr. Edwin R. Gilliland, Professor of Chemical Engineering, Massachusetts Institute of Technology. Dr. Jerome B. Wiesner, Special Assistant to the President for Science and Technology, is Chairman of the Committee.

¹ U.S. President, (John F. Kennedy). Public papers of the Presidents, 1962. Washington, U.S. Govt. Print. Off., 1963, pp. 874–875.

SPECIAL MESSAGE TO THE CONGRESS ON IMPROVING THE NATION'S HEALTH. FEBRUARY 7, 1963¹

TO THE CONGRESS OF THE UNITED STATES: Health, as Emerson said, is the "first wealth." This Nation has built an impressive health record. Life expectancy has been increased by more than 20 years since 1900; infant mortality rates have been dramatically reduced; many communicable diseases have been practically eliminated. We have developed or are close to developing the means for controlling many others. The intensive medical research effort begun shortly after World War II is now showing dramatic results. The array of modern drugs, appliances, and techniques available to prevent and cure disease is impressive in scope and in quality.

But each improvement raises our horizons; each success enables us to concentrate more on the remaining dangers, and on new challenges and threats to health. Some of these new challenges result from our changing environment, some from new habits and activities. More people than ever before are in those vulnerable age groups—the very young and the very old—which need the greatest amount of health services. More people are living in huge metropolitan and industrial

complexes, where they face a host of new problems in achieving safety even in the common environmental elements of food, water, land, and air. The hazards of modern living also raise new problems of psychological stability.

In addition to the long-neglected problems of mental illness and mental retardation on which I made recommendations earlier this week, other areas affecting our Nation's health also require serious and sustained attention:

—There is a shortage of professional health personnel. We must take prompt and vigorous action not only to increase the numbers of trained personnel but to perfect better means for making the most effective use of the health manpower now available.

—Health facilities must be improved and modernized. More of them need to be geared to the problems of older and long-term patients.

—Health care is not adequately available to our older citizens. Costs to aged individuals too often are prohibitively high, and we have not yet been effectively able to bring modern health services to many of them.

—Threats to the physical well-being of our families from the contamination of food, air and water, and from hazardous drugs and cosmetics, must be dealt with more promptly and more effectively.

—Health protection and care must be made more widely available to our children, particularly those whose parents cannot afford proper care and those who are suffering from crippling diseases.

In each of these key areas, this Nation has an obligation to strengthen its resources and services. The alternative is a weaker people and Nation, a waste of manpower and funds, and a denial to millions of people of a full and equal opportunity to life, liberty and the pursuit of happiness. The Federal Government has stimulated much of the recent progress in medical research, without any interference with scientific, academic or individual liberty. Our task now is to be equally decisive in putting this knowledge into practice. Financial provision for the recommendations made in this Message was included in the 1964 Budget which I transmitted to the Congress last month.

* * *

I. PROFESSIONAL HEALTH PERSONNEL

C. Environmental Health

The long-range assault of multiple environmental contaminations on human health are cumulative and interrelated. It is of great importance, therefore, that our efforts to learn about and control health hazards be unified and mutually supporting. The President's Science Advisory Committee, in cooperation with the Federal Council for Science and Technology, has undertaken a major review of the Government's activities with respect to the use of chemicals in the environment. Special attention is being given to the control of pesticides. Nearly 180 million pounds of pesticides valued at more than \$1 billion are used in the United States every year. If this review reveals need for additional authority, necessary recommendations will be made to the Congress.

I am renewing my recommendation of last year that authority be granted to the Surgeon General of the Public Health Service, with the approval of the Secretary of Health, Education, and Welfare, to bring environmental health functions together in one Bureau. I also ask that the Congress approve the funds requested in my 1964 budget for initial steps to establish a central facility in the Washington area which can serve as a focal point for related research, training and technical assistance in environmental health.

* * *

¹ U.S. President (John F. Kennedy). [Excerpted from] Special message to the Congress on improving the Nation's health. Public papers of the Presidents, 1963. Washington, U.S. Govt. Print. Off., 1964, pp. 140, 145.

LETTER TO THE PRESIDENT OF THE SENATE TRANSMITTING A REPORT ON WATER RESOURCES RESEARCH. FEBRUARY 18, 1963 ¹

DEAR MR. PRESIDENT: I am pleased to transmit herewith a report on the water resources research activities of the executive branch of the Government. This report was prepared by the Federal Council for Science and Technology with the assistance of a Special Task Group on Coordinated Water Resources Research having representation from the several Federal agencies involved.

The study on research in water resources is part of a comprehensive review of Federal research activities in natural resources. As indicated in my special messages to the Congress on natural resources and conservation in 1961 and 1962, the review is being undertaken by the Federal Council for Science and Technology at my direction, to strengthen and unify the total governmental research effort in the natural resources field. I fully subscribed to the view expressed in the covering memorandum by Dr. Jerome B. Wiesner, Chairman of the Federal Council for Science and Technology, that the study represents an important step in the development of a coordinated program of water resources research recommended by the Select Committee on National Water Resources.

The work of the Task Group on Coordinated Water Resources Research was taken into consideration in framing the administration's request for increased support of water resources research in fiscal year 1964. I commend the report for your consideration in connection with the budget request and the need for new legislation to stimulate research in the field of water resources at the colleges and universities.

Sincerely yours,

JOHN F. KENNEDY.

NOTE: The report was submitted to the President on February 13. It is published in "Federal Water Resources Research Activities," a Committee Print, dated March 25, 1963, for the Senate Select Committee on Interior and Insular Affairs, 88th Congress, 1st session (Government Printing Office).

For the recommendations of the Select Committee on National Water Resources, see Senate Report 29 (87th Cong.).

¹ U.S. President (John F. Kennedy). Public papers of the Presidents, 1963. Washington, U.S. Govt. Print. Off., 1964, p. 184.

LETTER TO THE PRESIDENT OF THE SENATE AND TO THE SPEAKER OF THE HOUSE TRANSMITTING REPORT "RESEARCH AND DEVELOPMENT ON NATURAL RESOURCES." JUNE 22, 1963¹

[RELEASED JUNE 22, 1963. DATED JUNE 21, 1963]

DEAR Mr. ———: I am pleased to transmit herewith a report on natural resources research in the Executive Branch of the Federal Government. This report was prepared by the Federal Council for Science and Technology with the assistance of its Committee on Natural Resources. Nearly 100 representatives from a score of Federal agencies participated in the preparation of the report.

This study on natural resources is directly related to the study of coordinated water resources research which was also prepared by the Federal Council and transmitted to you on February 18, 1963. As indicated in my Special Messages to the Congress on Natural Resources and Conservation in 1961 and 1962, the comprehensive review of which these studies are a part is being undertaken at my direction to strengthen and unify the total governmental research in the natural resources field.

The current study provides the first comprehensive inventory of existing natural resources research programs in the Executive Branch and indicates numerous opportunities for new research that would aid in assuring adequate supplies of raw materials, conservation of resources and preservation of a healthful and pleasing environment. In preparing it, the Federal Council took into consideration the recent report and recommendations of the National Academy of Sciences, made at my request, to evaluate the opportunities for science to contribute to conservation, development and use of natural resources.

In transmitting the report to me, Dr. Jerome B. Wiesner, Chairman of the Federal Council for Science and Technology, has pointed out that this inventory of activities on natural resources research should help prevent inadvertent duplication of effort and overlap of functions, and should indicate opportunities for mutually supporting activities in the future. It is an essential step in Government-wide planning.

The importance of coordination is implicit in the size of the Federal expenditure for resources research and development as assessed in the report. Budget requests for this purpose for fiscal year 1964 total \$1.5 billion, of which more than \$1 billion is for energy related research.

The Federal Council for Science and Technology will continue to provide policy level oversight and coordination in scientific and technical programs devoted to natural resources.

Sincerely yours,

JOHN F. KENNEDY.

NOTE: This is the text of identical letters addressed to the Honorable Lyndon B. Johnson, President of the Senate, and to the Honorable John W. McCormack, Speaker of the House of Representatives.

The 172-page report, dated May 1963, was released together with a White House summary. For letter of February 18, 1963, transmitting the Council's earlier report on water resources, see Item 70.

¹ U.S. President (John F. Kennedy). Public papers of the Presidents, 1963. Washington, U.S. Govt. Print. Off., 1964, pp. 496-497.

LETTER TO THE PRESIDENT OF THE SENATE AND TO THE SPEAKER OF
THE HOUSE TRANSMITTING REPORTS ON OCEANOGRAPHIC RESEARCH.
MARCH 19, 1964¹

DEAR MR. ———: Recognizing the continued interest by the Congress in advancing this Nation's program in oceanography, I am pleased to forward advance copies of two publications of the Federal Council for Science and Technology that set forth Government-wide plans and budget details.

These reports, entitled "National Oceanographic Program, Fiscal Year 1965, Parts I and II," contain an account of oceanic research to meet national goals, in keeping with the long range considerations previously submitted to the Congress. Information is also included concerning proposed funding for research, surveys, new ship and laboratory construction, and concerning program planning and coordination by the Council's Interagency Committee on Oceanography (ICO), to minimize unwitting duplication and program gaps.

The proposed Federal budget in oceanography is \$138 million. This is 11% more than Fiscal Year 1964 appropriations, which in turn equalled those for Fiscal Year 1963. This proposed growth is an absolute minimum if the country is to maintain the momentum necessary to achieve those objectives in oceanic research which have been previously enunciated by both President Kennedy and the Congress—to enhance our military defense; to develop marine mineral and fisheries resources; to control pollutions; to predict more accurately storms and tides that endanger life and property; to assist state, national and international bodies in wise legislation and regulation of commerce on the sea; and to extend scientific knowledge generally.

I especially should like to call attention to the Government-wide character of this program. Statutory responsibility for the conduct of related sectors are vested in a number of separate agencies. Special measures are thus being continued by the Office of Science and Technology and the Federal Council for Science and Technology, with the assistance of the ICO, to achieve effective interagency planning and coordination.

Sincerely yours,

LYNDON B. JOHNSON.

NOTE: This is the text of identical letters addressed to the Honorable Carl Hayden, President pro tempore of the Senate, and to the Honorable John W. McCormack, Speaker of the House of Representatives.

The letter was made public as part of a White House release concerning the reports published as ICO Pamphlet No. 15, dated March 1964 (50 pp., including Part I: Summary, Fiscal Year 1965, and Part II: The Program and Its Cost).

The release pointed out that the reports were the result of cooperative participation on the part of scientists, engineers, technicians, and administrative officers from numerous universities and industries, and from the State and National Governments. Dr. Donald F. Hornig, Director, Office of Science and Technology, served as Chairman of the Federal Council for Science and Technology, and James H. Wakelin, Jr., Assistant Secretary of the Navy, as Chairman of the Interagency Committee on Oceanography.

¹ U.S. President (Lyndon B. Johnson). Public papers of the Presidents, 1963-64. Washington, U.S. Govt. Print. Off., 1965, pp. 401-402.

LETTER TO THE PRESIDENT OF THE SENATE AND TO THE SPEAKER OF THE HOUSE TRANSMITTING REPORT ON THE WATER RESOURCES PROGRAM. MARCH 20, 1964¹

DEAR MR. ———: Recognizing the continued interest of the Congress in the Nation's water problems, I am pleased to transmit the accompanying report entitled "Federal Water Resources Research Program for Fiscal Year 1965." This report of the Federal Council for Science and Technology sets forth agency plans and interagency coordination of water research programs contained in the budget.

The report deals with an area which is essential to the future growth and well-being of the country. The importance of our water resources has been well recognized during the past four years in the Congress, the scientific community, and the public press, as well as in proposed legislation. Out of this attention has come the widely held conviction that in view of our growing water problems, increased attention and an effective research effort will be required of the Federal Government as well as the States, the universities, and private institutions.

The accompanying report contains an account of the projected program in water resources research for Fiscal Year 1965 which totals \$72,464,000 as compared with \$71,473,000 in the current fiscal year. The program and budget were developed under stringent budgetary constraints associated with my economy program in government, and therefore are considered the minimum effort consistent with the necessity for making progress in this area.

The Federal program of water resources research involves the efforts of 25 agencies within five major Departments and three independent offices. Involved, therefore, are many cooperative interrelationships and joint undertakings. The research program is also closely related to programs concerned with agriculture, public and industrial water supplies, pollution control, fish and wildlife, and river basin planning. Thus, the report also deals with matters of coordination and administration designed to avoid possible program gaps or unwitting duplication. A substantial beginning has also been made at determining the scope of a long-range program which will be adequate to meet our needs, and to priorities which will give attention to the most urgent problems.

I share the concerns of Congress regarding the growing water problems and, therefore, commend this report for your consideration in connection with the budget request and the need for new legislation to stimulate research in the field of water resources at the colleges and universities. The Office of Science and Technology and the Federal Council for Science and Technology will continue to give this area the attention required to achieve and maintain effective interagency plan-

ning and coordination and an adequate effort in water resources research.

Sincerely,

LYNDON B. JOHNSON.

NOTE: This is the text of identical letters addressed to the Honorable Carl Hayden, President pro tempore of the Senate, and to the Honorable John W. McCormack, Speaker of the House of Representatives.

The letter was made public as part of a White House release announcing the transmittal to the Congress of the first progress report of the Committee on Water Resources Research of the Federal Council for Science and Technology (Feb. 1964, 65 pp., Government Printing Office).

The report proposed an increase in expenditures for water research from \$71,473,000 in fiscal year 1964 to \$72,464,000 in 1965. It recommended studies ranging from highly theoretical research on the energy status of water molecules to such directly applicable matters as the amount of irrigation water and best timing for efficient use in agriculture. It assigned high priorities to research in ground water, including an infiltration process and soil-plant-water relationships; to socio-economic research; and to research in water quality.

Dr. Donald F. Hornig served as Chairman of the Federal Council for Science and Technology and William C. Ackermann as Chairman of the Committee on Water Resources.

On August 1 the White House announced a further step in the field of water resources research. A White House release of that date stated that the President met with his Science Adviser to discuss plans for U.S. participation in the International Hydrological Decade—a worldwide effort to advance knowledge of water. The program, beginning in 1965, would involve the establishment of stations and networks throughout the world to measure and track water in the hydrologic cycle from rain to the underground water table and eventually back to the atmosphere. The release stated that the President pledged support of the International Hydrological Decade studies by Government agencies and that he urged cooperation on the part of the universities and scientific societies.

¹ U.S. President (Lyndon B. Johnson). Public papers of the Presidents, 1963-64. Washington, Govt. Print. Off., 1965, pp. 403-404.

LETTER TO DR. KILLIAN IN RESPONSE TO REPORT: "TOWARD BETTER UTILIZATION OF SCIENTIFIC AND ENGINEERING TALENT." JULY 12, 1964¹

[RELEASED JULY 12, 1964. DATED JULY 7, 1964]

DEAR DR. KILLIAN: In completing such a broad analysis of problems concerned with the utilization of scientific and technical talent and making recommendations for their solution, your Committee has rendered a significant public service.

Your report deals with issues which are important in carrying out this Nation's commitment to deploy science and technology boldly and effectively in the interest of the Nation's welfare. Your counsel is especially timely because of the intensified interest this Administration is taking in providing rewarding employment opportunities and education to all our citizens, and because of the need to strengthen the relationships between Government, industry, and colleges and universities.

The higher salaries at the upper levels of Government service which your Committee supports would help redress the persistent imbalance between Governmental and private salaries that penalize the Government in meeting competition for talent. The Administration's bill is a major step toward that end.

The Federal Government has a special responsibility to conduct its affairs with an enlightened concern for the critical part it now plays in the utilization of the Nation's manpower. I am thus asking that Dr. Donald F. Hornig, my Science Advisor, and Secretary of Labor Willard Wirtz, as Chairman of my Committee on Manpower, report to me on further steps that the Government should take in light of your Committee's recommendations.

Please extend to all of those who have given generously of their time in the conduct of this study my sincere appreciation for their contributions.

Sincerely,

LYNDON B. JOHNSON.

NOTE: The letter was part of a White House release making public the report "Toward Better Utilization of Scientific and Engineering Talent, A Program for Action" (193 pp., National Academy of Sciences), prepared by the Committee on Utilization of Scientific and Engineering Manpower, under the chairmanship of Dr. James R. Killian, Jr.

The Committee was appointed by the National Academy of Sciences following a request of President Kennedy in 1961 that the Academy undertake a study on the utilization of the existing supply of technical manpower. At the same time the President's Science Advisory Committee and the Federal Council for Science and Technology were asked to study requirements for the development of new scientists and engineers.

In its report the Committee's recommendations called for action by and cooperation among the Federal Government, industry, and the universities to:

1. Strengthen the management of research in all sectors, through improved contracting procedures and efforts to identify and train more project managers and engineers who combine understanding of a complex, changing technology with mastery of the art of leadership.

2. Achieve a balance in the allocation of scarce scientific and engineering talent between "big science" and large development projects on the one hand, and the individual investigator (or scholar-teacher) and the manpower requirements of the civilian economy on the other.

3. Greatly expand the opportunities open to individual scientists and engineers to renew, update, and extend their skills throughout their professional careers.

Other Committee recommendations called for the development of statistical information on scientific and technical manpower resources to permit the Government to assess the impact of major new technological ventures on employment and manpower utilization before reaching a decision to proceed, and urged a continuing assessment of the total impact of Government policies and practices on the deployment and utilization of manpower.

The text of Dr. Killian's letter of transmittal, dated June 22, was also released.

¹ U.S. President (Lyndon B. Johnson). Public papers of the Presidents, 1963-64. Washington, Govt. Print. Off., 1965, pp. 838-859.

LETTER TO THE PRESIDENT OF THE SENATE AND TO THE SPEAKER OF THE HOUSE TRANSMITTING THE NATIONAL OCEANOGRAPHIC PROGRAM. MARCH 2, 1965¹

DEAR MR. PRESIDENT: (DEAR MR. SPEAKER:) I am very happy to transmit to the Congress my oceanographic program for fiscal year 1966.

For tens of thousands of years—ever since man has possessed the power to sense and reason—he has been aware of the seas around him. This awareness has varied from disdain to superstition, as man alternately sailed and fished the sea on the one hand, and worshipped it on the other.

But never until recently did man seek great understanding of the oceans, because he saw little necessity. There was always a new frontier, an unexplored land, unexploited territory.

Now our view of the seas has had to undergo a drastic change. We have always considered them as barriers to invasion; we now must see them as links, not only between peoples, but to a vast new untapped resource.

It is becoming increasingly clear that there are large mineral deposits under the oceans. But before this treasure becomes useful we must first locate it and develop the technology to recover it economically. We must also learn much more about marine biology if we are to tap the great potential food resources of the seas.

Our oceanographic research fleet is now the finest and best equipped in the world. Since the turn of the decade, our nation has been engaged in a program of building for oceanic development. We have designed and constructed the first new ships for oceanography, which, together with our conversions, have added 42 hulls, more than doubling the fleet size.

We have added several new laboratories and supporting activities, fitted out with modern instrumentation. Classrooms in over fifty colleges and universities throughout our land are occupied by over triple their former numbers of students—who in a real sense represent our greatest resource of all.

The challenge now is to expand our utilization of these resources. Our ship construction program is nearly complete so that although the Federal budget of \$141 million in oceanography is only 2% greater than requested last year, it includes a significantly greater proportion for research and oceanic surveys than in previous years. I believe that the total amount is an absolute minimum if our nation is to use its capabilities well and to progress toward its objectives in oceanography.

We are looking forward to a period where our investment in ocean research may bear fruit in terms of faster and more comfortable transportation, more highly developed exploitation of our marine mineral and fisheries resources, increased pollution control, more accurate prediction of storms and tides that endanger life and property, and the strengthening of our national defense.

I especially invite your attention to the manner in which the individual Federal agencies' programs have been blended toward the attainment of common goals. I consider this coordination, achieved under the guidance of the Federal Council for Science and Technology, to be essential if we are to exploit the seas in an effective manner.

However, it is just as essential that the Congress view this program as a unified thrust seaward. I therefore urgently recommend that when the various committees of the Congress review their portions of this program they keep its entirety in mind. We will all thus be enabled to see, together, that this important aspect of our national interest proceeds toward fulfillment.

Sincerely yours,

LYNDON B. JOHNSON.

NOTE: This is the text of identical letters addressed to the Honorable Hubert H. Humphrey, President of the Senate, and to the Honorable John W. McCormack, Speaker of the House of Representatives.

The letter was made public as part of a White House release announcing the President's transmittal to Congress of a document entitled "National Oceanographic Program, Fiscal Year 1966." The document was prepared by the Interagency Committee on Oceanography of the Federal Council for Science and Technology (Government Printing Office, 73 pp.).

The White House release stated that the Federal Council for Science and Technology was composed of officials of policy rank from eight departments and agencies having major interest in research and development, together with official observers from three other agencies. Donald F. Hornig, Director, Office of Science and Technology, served as Chairman of the Federal Council for Science and Technology, and Assistant Secretary of the Navy Robert W. Morse, as Chairman of the Council's Interagency Committee on Oceanography. The Foreword to the National Oceanographic Program document points out that it is one of several Government-wide programs planned and coordinated by the President, with the advice and assistance of the Office of Science and Technology.

¹U.S. President (Lyndon B. Johnson). Public papers of the Presidents, 1965. Washington, U.S. Govt. Print. Off., 1966, pp. 243-244.

MESSAGE TO THE CONGRESS TRANSMITTING SIXTH ANNUAL REPORT
ON WEATHER MODIFICATION. MAY 24, 1965¹

TO THE CONGRESS OF THE UNITED STATES: I am transmitting herewith for the consideration of the Congress the 6th Annual Report on Weather Modification (for Fiscal Year 1964) as submitted to me by the Director of the National Science Foundation.

The development of methods for altering weather and climate to the benefit of mankind is a subject of quickening interest in the Congress and the Executive Branch of the Government of the United States—as, indeed, it is to all of the human race. We recognize that achievement of such a capability would mean vast economic and social gains for human life on this earth. I believe it is both symptomatic and symbolic of the character of the American people that we are now engaged in first steps toward this goal, not for any narrow national purpose but in the confidence that such benefits will be shared as a mutual blessing with all of our fellowmen.

We hope someday to acquire the knowledge permitting us to minimize the incidence and severity of hurricanes, tornadoes, and other violent storms and, also, to be able to improve the temperature and rainfall conditions in agricultural and industrial regions. This hope is not fanciful or unrealistic, but it would be misleading to suggest that such a day is near now.

The scientific and engineering obstacles that must be overcome rank in magnitude with those encountered in developing peaceful uses of nuclear power and compare with those now being encountered in our attempts to place a man on the moon. But weather modification is still several steps behind atomic energy and the exploration of space. These latter are essentially engineering problems—extremely complex of course, but in areas where the basic scientific laws are well understood. In contrast, the achievement of large scale purposeful weather modification depends upon scientific knowledge not yet acquired—knowledge about atmospheric phenomena ranging from the interactions of minute water droplets to the behavior of global air circulations. Furthermore, it is essential for us to investigate the manner in which man may at present be inadvertently changing weather and climate.

Substantial progress has been made, as this report reflects. But the pace has been slow. To advance the rate of progress, an effort of larger scope and direction is needed both in conducting basic research and in developing means to put the knowledge to work.

Over the past year, there have been positive actions which are reviewed in this report. These actions include the following:

1. Increased support for atmospheric research by a number of Federal Agencies, including the National Science Foundation, U.S. Weather Bureau, National Aeronautics and Space Administration, Department of the Interior, and the Department of Defense.

2. Establishment of a special commission on weather modification by the National Science Foundation charged with assessing the anticipated benefits to be gained from weather modification efforts; the general paths which research and development should take; the support required; and the legal, social, and political problems that will be encountered if weather modification techniques are more broadly applied.

3. Greater emphasis on the graduate research and education of promising students who will be involved in atmospheric research.

4. Strengthened cooperation among Federal Agencies through the Federal Council for Science and Technology.

5. Stepped up international cooperation in support of weather activities because it is clear that large scale weather or climate control schemes cannot be contained within national boundaries.

6. It is particularly noteworthy—and welcome—that more activity has been initiated by Committees of both Houses of Congress looking carefully into weather modification activities in the light of increased Federal investment in field tests and backup basic research, and in response to increasing interest in moving quickly toward application of our knowledge and capabilities.

If the day is distant and dim when the benefits of weather modification will become real, tangible and universally enjoyed, it is no longer possible for any to argue justifiably that such a day is beyond the reach of man at all. Our knowledge must be enlarged and perfected, far beyond its present limits. But we can—and we do—believe that eventually these efforts underway now will succeed. That success will inure to the credit of the interest, initiative and understanding of the Congress in offering encouragement and support to this worthy and important research.

LYNDON B. JOHNSON.

THE WHITE HOUSE
May 24, 1965

NOTE: The report, entitled "Weather Modification," was published by the Government Printing Office (68 pp.).

¹ U.S. President (Lyndon B. Johnson). Public papers of the Presidents, 1965. Washington, U.S. Govt. Print. Off., 1966, pp. 570-572.

LETTER TO THE PRESIDENT OF THE SENATE AND TO THE SPEAKER OF THE HOUSE ON THE FEDERAL WATER RESOURCES RESEARCH PROGRAM. MAY 25, 1965¹

DEAR MR. PRESIDENT: (DEAR MR. SPEAKER:) Even before there was a United States, people of this land were using and developing its water resources. Over the years the nature of the problems has changed and the size and scope of the solutions has increased but our technology has kept abreast of the needs.

Today far greater demands are pressing upon both our water resources and the technology required to meet our varied water needs. Our streams and groundwater resources must meet the needs of nearly 200 million people for food, fiber and industrial processing. At the same time we have expected our streams to carry off the waste products of our homes, industries and farms. We must also protect our people from damaging floods such as those which have recently occurred along the upper Mississippi River.

A projection of our population growth over the next few decades could lead to the conclusion that very serious water shortages might be expected over much of the nation in the not far distant future. Pollution has already caused serious problems in many of our streams and lakes, and, with a growing population, pollution problems could extend to almost all of our water sources.

Such predictions must not come true. Our scientists and engineers will find solutions to meet these problems as they develop, if we maintain a continuing and effective research program. Earlier this year, I transmitted to you legislation expanding and extending one aspect of the water research program—desalting. Today I am pleased to transmit a report summarizing the Federal Water Resources Research Program for Fiscal Year 1966 prepared by the Committee on Water Resources Research of the Federal Council for Science and Technology.

The program is not large but it is vital. The total proposed expenditure for the 1966 Fiscal Year is only \$101 million, less than one percent of the total national expenditure on water supply, water control and waste treatment. But the Committee is at work on the preparation of a long range research program of incalculable importance to our future. I am asking the Chairman of the Federal Council to press forward on the development of this plan.

We must be sure that our research effort is adequate to guarantee sufficient water for all our future needs. On this there can be no compromise. We must, also, strive through research to find a better basis for minimizing the damaging effects of water and to preserve and protect the natural beauty of our streams and lakes for the health and enjoyment of all our people.

Sincerely,

LYNDON B. JOHNSON.

NOTE: This is the text of identical letters addressed to the Honorable Hubert H. Humphrey, President of the Senate, and to the Honorable John W. McCormack, Speaker of the House of Representatives.

The report "Federal Water Resources Research Program for Fiscal Year 1966" is dated February 1965 (Government Printing Office, 10 pp.).

For the President's letter transmitting proposed legislation on the water desalting research program, see Item 143.

¹ U.S. President (Lyndon B. Johnson). Public papers of the Presidents, 1965. Washington, U.S. Govt. Print. Off., 1966, pp. 574-575.

STATEMENT BY THE PRESIDENT TO THE CABINET AND MEMORANDUM ON STRENGTHENING ACADEMIC CAPABILITY FOR SCIENCE. SEPTEMBER 14, 1965¹

Throughout the postwar years, it has been my abiding and actively-supported conviction that the policies of this Nation in support of the advance of science would have a decisive role in determining the extent to which we fulfill our potential as a Nation—and a free society.

On occasion, during these years, there have appeared attitudes almost medieval in their myopia toward the meaning and promise of the growth of human knowledge. Happily, these attitudes have not prevailed and our national policies have been guided by reason, light, and faith in the future of man. As a result, American science today leads the world—free, unfettered, and devoted to the ends of bettering the condition of man in every land.

I say this, by way of preface, because I am proud of the part I have been privileged to play—in the Congress and as Vice President—in opening the doors through which we have moved to some of our most significant scientific gains. Now, in this Office I am determined that we shall marshal our resources and our wisdom to the fullest to as-

sure the continuing strength and leadership of American science and to apply the information yielded by its inquiry to the problems which confront our society and our purposes in the world.

Our policies and attitudes in regard to science cannot satisfactorily be related solely to achievement of goals and ends we set for our research. Our vision in this regard is limited at best. We must, I believe, devote ourselves purposefully to developing and diffusing—throughout the Nation—a strong and solid scientific capability, especially in our many centers of advanced education. Our future must rest upon diversity of inquiry as well as the universality of capability.

This is very much a concern and a responsibility of the Federal Government and all the departments and agencies of the executive branch.

Today the Federal Government is spending \$15 billion annually on research and development activities. Nine percent of this—\$1.3 billion—is being spent in our universities on research grants and contracts. Additional sums are spent for educational purposes such as fellowship or training grants and the programs provided by the Higher Education Facilities Act or the National Defense Education Act.

The impact of these Federal funds is significant. They account for about two-thirds of the total research expenditures of colleges and universities. The manner in which such funds are spent clearly has a most important effect upon advanced education in this country and upon the future of our Nation's universities.

Almost all of the Federal research money is provided to produce results that are needed now and in the future to achieve our many national goals in health, in defense, in space, in agriculture, and so on. Of the total provided to universities, 34 percent comes from the National Institutes of Health, 23 percent from the Department of Defense, 9 percent from NASA, 6 percent from the AEC, and 4 percent from Agriculture. Only 13 percent is provided by the National Science Foundation—the only agency which supports science and science education as such.

The purpose of the new policy statement I am issuing today is to insure that our programs for Federal support of research in colleges and universities contribute more to the long-run strengthening of the universities and colleges so that these institutions can best serve the Nation in the years ahead.

At present, one-half of the Federal expenditures for research go to 20 major institutions, most of which were strong before the advent of Federal research funds. During the period of increasing Federal support since World War II, the number of institutions carrying out research and providing advanced education has grown impressively. Strong centers have developed in areas which were previously not well served. It is a particular purpose of this policy to accelerate this beneficial trend since the funds are still concentrated in too few institutions in too few areas of the country. We want to find excellence and build it up wherever it is found so that creative centers of excellence may grow in every part of the Nation.

Under this policy more support will be provided under terms which give the university and the investigator wider scope for inquiry, as contrasted with highly specific, narrowly defined projects. These and many more actions will increase the capacity of our universities to

produce well-trained scientists and to serve as a source of the ideas on which our national welfare depends.

By adopting this policy, I am asking each agency and department with major research responsibilities to reexamine its practices in the financing of research. I want to be sure that, consistent with agency missions and objectives, all practical measures are taken to strengthen the institutions where research now goes on, and to help additional institutions to become more effective centers for teaching and research.

Memorandum for Heads of Departments and Agencies:

A strong and vital educational system is an essential part of the Great Society. In building our national educational system, we must bear in mind all of the parts, and all of the levels—from Head Start for preschool children to the most advanced university levels. At the apex of this educational pyramid, resting on the essential foundation provided for the lower levels, is the vital top segment where education and research become inseparable. The Federal Government has supported academic research in agriculture for over a half century and in the physical sciences, life sciences, and engineering since World War II; the returns on this national investment have been immense.

Of the \$15 billion which the Federal Government is spending in research and development activities this year, \$1.3, or about 9 percent is spent in universities. The \$1.3 billion, which includes only Federal research grants and contracts, accounts for about two-thirds of the total research expenditures of our American colleges and universities. Over 25,000 graduate students in engineering, mathematics, physical and life sciences are supported indirectly by employment under these research grants and contracts. Plainly the Federal expenditures have a major effect on the development of our higher educational system.

The strength of the research and development programs of the major agencies, and hence their ability to meet national needs, depends heavily upon the total strength of our university system. Research supported to further agency missions should be administered not only with a view to producing specific results, but also with a view to strengthening academic institutions and increasing the number of institutions capable of performing research of high quality.

The functions of the Federal agencies in relation to the strengthening of academic institutions are as follows:

a. The National Science Foundation continues to have responsibility for augmenting the research capabilities of academic institutions in all fields of science through the support of basic research and research facilities and through measures for improving the quality of education in the sciences;

b. The Department of Health, Education, and Welfare will contribute to the overall development of colleges and universities and to the development of health professional schools, particularly through programs of the Office of Education and the Public Health Service;

c. All Federal agencies with substantial research and development programs have an interest and need to develop academic capabilities for research and scientific education as a part of their research missions.

To the fullest extent compatible with their primary interests in specific fields of science, their basic statutes, and their needs for research results of high quality, all Federal agencies should act so as to:

a. Encourage the maintenance of outstanding quality in science and science education in those universities where it exists;

b. Provide research funds to academic institutions under conditions affording them the opportunity to improve and extend their programs for research and science education and to develop the potentialities for high quality research of groups and individuals, including capable younger faculty members:

c. Contribute to the improvement of potentially strong universities through measures such as:

—Giving consideration, where research capability of comparable quality exists, to awarding grants and contracts to institutions not now heavily engaged in Federal research programs;

—Assisting such institutions or parts of institutions in strengthening themselves while performing research relevant to agency missions, by such means as establishing university-administered programs in specialized areas relevant to the missions of the agencies.

Funds for these purposes should be provided on a scale and under conditions appropriate to the mission of an agency and in accordance with any Government-wide policy guidelines which may be established.

Departments and agencies should carefully assess the degree to which and the manner in which their existing programs support this policy, and when indicated, should use a larger proportion of their research funds in accordance with the intent of the policy. The means for attaining this objective will be determined by each department and agency. In carrying out the policy, the various Federal agencies supporting research at a university should act in concert to a greater degree in making decisions, so as to make the university better able to meet the collective needs of the agencies and to make the Federal support most effective in strengthening the university.

My Special Assistant for Science and Technology, Dr. Donald Hornig, with the help of the Federal Council for Science and Technology, will follow the response of the departments and agencies to this policy. I have asked him to obtain monthly progress reports and submit them to me.

¹ U.S. President (Lyndon B. Johnson). Public papers of the Presidents, 1965. Washington, U.S. Govt. Print. Off., 1966, pp. 995-998.

LETTER TO THE PRESIDENT OF THE SENATE AND TO THE SPEAKER OF THE HOUSE TRANSMITTING REPORT "A TEN-YEAR PROGRAM OF FEDERAL WATER RESOURCES RESEARCH." MARCH 19, 1966¹

[RELEASED MARCH 19, 1966. DATED MARCH 18, 1966]

DEAR MR. PRESIDENT: (DEAR MR. SPEAKER:) Last year, through my Special Assistant for Science and Technology, I asked the Committee on Water Resources Research of the Federal Council for Science and Technology to speed the development of a comprehensive, long-range water research program.

That task has now been completed.

This report—"A Ten-Year Program of Federal Water Resources Research"—is the result of our efforts.

The growth of our population and industry has placed new demands on our water supplies. We are confronted with water shortages in many sections of our country. Today, virtually every river system in America is touched by pollution. This menace grows more serious each day.

As I have said before, we must combine all of the means at our disposal—Federal, state, local and private—to meet the challenges posed by our water resource problems. The Water Resources Planning Act and the Water Pollution Control Act, passed at the last session, and the Clean Rivers Demonstration Act now pending in the Congress are important steps forward.

We must seek the knowledge and understanding essential to support our efforts.

We must apply the very best of science and technology to solve our mounting water resource problems.

We must continue our search for bold, new ideas.

A strong, well planned program of research has now become a national necessity. The growth of knowledge in this vital area is important to our future.

The ten-year research program outlined in the report—which will be refined and revised as the future state of our knowledge grows—establishes a guideline for action. The report pinpoints those areas of research in need of immediate attention and specifies research goals in over 40 important categories. It has been used as a basis for preparing our Fiscal Year 1967 Budget requests.

I recommend that the various committees of Congress concerned with our water resources carefully consider what this report has to say.

Sincerely,

LYNDON B. JOHNSON.

NOTE: This is the text of identical letters addressed to the Honorable Hubert H. Humphrey, President of the Senate, and to the Honorable John W. McCormack, Speaker of the House of Representatives.

The report, entitled "A Ten-Year Program of Federal Water Resources Research" and dated February 1966 (Government Printing Office, 88 pp.), was issued by the Committee on Water Resources Research of the Federal Council for Science and Technology.

¹ U.S. President (Lyndon B. Johnson). Public papers of the Presidents, 1966. Washington, U.S. Govt. Print. Off., 1967, pp. 335-336.

LETTER TO THE PRESIDENT OF THE SENATE AND TO THE SPEAKER OF THE HOUSE TRANSMITTING A SUMMARY OF THE NATIONAL ATMOSPHERIC SCIENCES PROGRAM, FISCAL YEAR 1967. MAY 13, 1966 ¹

DEAR MR. PRESIDENT: (DEAR MR. SPEAKER:) I have the honor to transmit to the Congress a summary of the Federal Government's "National Atmospheric Sciences Program" for Fiscal Year 1967, prepared by the Federal Council for Science and Technology.

The summary covers the coordinated activities of 10 Federal agencies engaged in 25 important lines of scientific research and service. These efforts are directed at:

- better understanding the atmosphere in which we live;
- finding new ways to predict the weather;
- providing greater insights into the challenge of controlled weather modification.

The potential economic benefits of this research are enormous and important not only to Americans, but to men everywhere.

To move successfully from the hopes of research to the reality of results means that we must first increase our knowledge of the atmosphere. Much of the progress in this field will come from the Government's atmospheric science program which supports research and experimentation in creative partnerships across the nation with the scientific community and industry.

Taken alone, however, our own studies and research will not be enough, for the environment is global and indivisible. We know, for example, that a storm along the Florida coast may well begin off the shores of another continent.

We can reach our goals sooner if we work closely with other nations in mutually beneficial endeavors. Together, we can share our knowledge and take new strides to cope with the ancient enemies of storm and drought and flood. That is why I have recently pledged that the United States will participate in the World Weather Watch, the most extensive international effort yet devised to enhance our knowledge of the world's atmosphere.

The world has already begun to reap the benefits of advanced space technology. Two weather satellites, the ESSA 1 and 2, are now in orbit. Through these scientific marvels, intense storms on both sides of the Indian Ocean were detected in time to help minimize danger and damage. This is only the beginning of the vast promise modern science holds, in peaceful pursuits, to unlock the mysteries of our atmosphere and to make our lives and the lives of our children easier and happier.

I urge the committees of Congress interested in the atmospheric sciences program to consider the attached summary report.

Sincerely,

LYNDON B. JOHNSON.

NOTE: This is the text of identical letters addressed to the Honorable Hubert H. Humphrey, President of the Senate, and to the Honorable John W. McCormack, Speaker of the House of Representatives.

The President transmitted ICAS Report No. 10, entitled "National Atmospheric Sciences Program, Fiscal Year 1967" (48 pp.). The report, dated January 1966, was prepared by the Interdepartmental Committee for Atmospheric Sciences and made available "for official use only" by the Federal Council for Science and Technology.

¹ U.S. President (Lyndon B. Johnson). Public papers of the Presidents, 1966. Washington, U.S. Govt. Print. Off., 1967, pp. 505-506.

STATEMENT BY THE PRESIDENT UPON SIGNING ORDER ENLARGING THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY. NOVEMBER 8, 1967¹

I need the coordinated advice and help of every Federal agency with major responsibilities in science and technology. The addition of State, HUD, and DOT members to the Federal Council for Science and Technology will make the Council more effective.

NOTE: The President's statement was made public as part of the White House release announcing the issuance of Executive Order 11381 (3 Weekly Comp. Pres. Docs., p. 1538; 32 F.R. 15629; 3 CFR, 1967 Comp., p. 326). The order amended Executive Order 10807 of March 13, 1959 (24 F.R. 1897; 3 CFR, 1959-1963 Comp., p. 329), which established the Council, by adding to its members representatives of the Departments of State, Housing and Urban Development, and Transportation. Increasing involvement by these departments with matters of science and technology, the release said, had made desirable their representation on the Council, which is chaired by Dr. Donald F. Hornig, Special Assistant to the President for Science and Technology (3 Weekly Comp., Pres. Docs., p. 1537).

¹ U.S. President (Lyndon B. Johnson). Public papers of the Presidents, 1967. Washington, U.S. Govt. Print. Off., 1968, p. 1002.

FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY. EXECUTIVE ORDER
1138.1 NOVEMBER 8, 1967¹

AMENDING EXECUTIVE ORDER NO. 10807 OF MARCH 13, 1959, RELATING TO
THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

By virtue of the authority vested in me as President of the United States, it is ordered that Executive Order No. 10807 of March 13, 1959, entitled "Federal Council for Science and Technology," be, and it is hereby, amended by substituting for subsection (b) of section 1 thereof the following:

"(b) The Council shall be composed of the Special Assistant to the President for Science and Technology and one representative of each of the following: Department of Agriculture, Department of Commerce, Department of Defense, Department of Health, Education, and Welfare, Department of Housing and Urban Development, Department of the Interior, Department of State, Department of Transportation, Atomic Energy Commission, National Aeronautics and Space Administration, and National Science Foundation. Each such representative shall be an official of policy rank designated by the head of the Federal agency concerned, and, in the case of the Atomic Energy Commission, shall be its Chairman or another member of the Commission designated by the Chairman of the Commission. A representative of the Director of the Bureau of the Budget designated by the Director may attend meetings of the Council as an observer."

LYNDON B. JOHNSON.

The White House
November 8, 1967

[Filed with the Office of the Federal Register, 9:54 a.m., November 9, 1967.]

¹ Federal Council for Science and Technology (Executive Order 11381, November 8, 1967). Weekly compilation of presidential documents, v. 3, November 13, 1967: 1537.

FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY¹

STATEMENT BY THE PRESIDENT UPON SIGNING EXECUTIVE ORDER ENLARGING
THE COUNCIL. NOVEMBER 8, 1967

The President today issued an Executive order enlarging the Federal Council for Science and Technology by adding to its membership representatives of three departments—the Department of State, the Department of Housing and Urban Development, and the Department of Transportation.

In signing today's Executive order the President said, "I need the coordinated advice and help of every Federal agency with major responsibilities in science and technology. The addition of State, HUD, and DOT members to the Federal Council for Science and Technology will make the Council more effective."

The involvement of the Department of State with scientific and technological matters is now so extensive that the Department must interact effectively with other agencies. Similarly, the Department of Housing and Urban Development and the Department of Transportation are affected by and use science and technology to a degree which makes their representation on the Council important.

The membership of the Federal Council for Science and Technology will now be composed of the Special Assistant to the President for Science and Technology and one representative of each of the following:

- Department of Agriculture
- Department of Commerce
- Department of Defense
- Department of Health, Education, and Welfare
- Department of Housing and Urban Development
- Department of the Interior
- Department of State
- Department of Transportation
- Atomic Energy Commission
- National Aeronautics and Space Administration
- National Science Foundation

Dr. Donald F. Hornig, Special Assistant to the President for Science and Technology, is the present Chairman of the Council.

The Council has the duty of considering problems and developments concerning the overall advancement of the Nation's science and technology and the further duty of considering and recommending measures for the effective implementation of Federal policies concerning the administration and conduct of Federal programs in science and technology.

The Council was established by Executive order in 1959.

¹ Federal Council for Science and Technology (Statement by the President upon signing executive order enlarging the council, November 8, 1967). Weekly compilation of presidential documents, v. 3, November 13, 1967 : 1533.

NOISE IN OUR ENVIRONMENT ¹

STATEMENT BY THE PRESIDENT ON THE REPORT OF THE FEDERAL COUNCIL
FOR SCIENCE AND TECHNOLOGY. NOVEMBER 4, 1968

President Johnson today challenged industry, universities, and public authorities to make a concerted attack on the problem of noise in our environment. He also directed the Federal departments and agencies to undertake or expand programs to reduce the problems created by the rising tide of noise.

The President said: "We dare not be complacent about this ever mounting volume of noise. In the years ahead, it can bring even more discomfort—and worse—to the lives of people.

"The facts are:

"A minimum of six million and as many as 16 million industrial workers are threatened with degrees of loss of hearing from exposure to noise on the job.

"The sources of irritating and possibly physically harmful noise are multiplying rapidly, and the intensity of the assault on people by noise is growing.

"Many ways to reduce noise levels are known and are practical. Trucks can be designed so that they produce less noise. Expressways and main traffic arteries can be located to reduce the annoyance of

noise. Buildings can be designed so that less noise is transmitted, and plumbing can be designed and installed to be less noisy.

"Other kinds of noise cannot be reduced without first doing some further research. This is true of the noise generated by jet aircraft engines.

"What is needed is greater attention to the problem and an attack on it from many angles—by local housing authorities, manufacturers of equipment, highway, rail and air authorities, insurance companies, labor organizations, and scientists in industry, non-profit and university laboratories."

The President released a report entitled "Noise—Sound Without Value," prepared under the direction of the Federal Council for Science and Technology. The Council is chaired by the President's Science Adviser, Dr. Donald F. Hornig.

The report discussed the relation between noise and health and points up the variety of annoying sources of noise such as transportation equipment, building construction and demolition, road building and repair, installation and repair of utilities, lawn mowers, air conditioners, plumbing systems, appliances, and industrial machinery, which afflict us.

The report reviews existing Federal programs involving research, education, and the setting and enforcement of standards and guidelines, and considers the further steps which need to be taken. The President endorsed the recommended allocation of responsibilities among Federal agencies, and directed that steps be taken to improve coordination among them and between the Federal Government, the private sector, and State and municipal authorities.

NOTE: The report is entitled "Noise—Sound Without Value: Committee on Environmental Quality of the Federal Council for Science and Technology" (56 pp., processed). The statement was released at San Antonio, Texas.

¹ Noise in our environment (Statement by the President on the report of the Federal Council for Science and Technology, November 4, 1968). Weekly compilation of presidential documents, v. 4, November 11, 1968: 1575-1576.

STATEMENT BY THE PRESIDENT UPON RELEASING A REPORT ON NOISE IN THE ENVIRONMENT. NOVEMBER 4, 1968¹

We dare not be complacent about this ever mounting volume of noise. In the years ahead, it can bring even more discomfort—and worse—to the lives of people.

The facts are:

A minimum of six million and as many as 16 million industrial workers are threatened with degrees of loss of hearing from exposure to noise on the job.

The sources of irritating and possibly physically harmful noise are multiplying rapidly, and the intensity of the assault on people by noise is growing.

Many ways to reduce noise levels are known and are practical. Trucks can be designed so that they produce less noise. Expressways and main traffic arteries can be located to reduce the annoyance of noise. Buildings can be designed so that less noise is transmitted, and plumbing can be designed and installed to be less noisy.

Other kinds of noise cannot be reduced without first doing some further research. This is true of the noise generated by jet aircraft engines.

What is needed is greater attention to the problem and an attack on it from many angles: by local housing authorities, manufacturers of equipment, highway, rail and air authorities, insurance companies, labor organizations, and scientists in industry, nonprofit and university laboratories.

NOTE: The statement was made public as part of the White House release announcing that the President had directed Federal departments and agencies to make concerted efforts to find solutions to the problem of rising noise levels in the environment. The text is printed in the Weekly Compilation of Presidential Documents (vol. 4, p. 1375).

The 56-page report, entitled "Noise—Sound Without Value," was prepared by the Committee on Environmental Quality, Federal Council for Science and Technology, under the direction of Dr. Donald F. Hornig, Special Assistant to the President and Director of the Office of Science and Technology.

The statement was released at San Antonio, Texas.

¹ U.S. President (Lyndon B. Johnson). Public papers of the Presidents, 1968–69. Washington, U.S. Govt. Print. Off., 1970, pp. 1113–1114.

STATEMENT APPROVING WIDER USE OF FEDERAL LABORATORY EQUIPMENT BY UNIVERSITY SCIENTISTS. FEBRUARY 21, 1969¹

The equipment of many Federal laboratories is superb and often unique. This investment should be viewed as a national resource and not one for the exclusive use of the laboratory staff members. While many scientists and engineers from universities now frequently use Federal research facilities, an even closer and more extensive cooperative relation will be productive. I am therefore approving a policy designed to bring this about. Dr. DuBridge will be able to implement the policy with the help of the Federal Council for Science and Technology, which has recommended its adoption.

NOTE: The statement was made public as part of a White House release announcing that the President had directed his Science Adviser, Dr. Lee A. DuBridge, to monitor the new policy.

¹ U.S. President (Richard M. Nixon). Public papers of the Presidents, 1969. Washington, U.S. Govt. Print. Off., 1971, p. 124.

MEMORANDUM ABOUT GOVERNMENT PATENT POLICY. AUGUST 23, 1971¹

Memorandum for Heads of Executive Departments and Agencies:

On October 10, 1963, President Kennedy forwarded to the Heads of Executive Departments and Agencies a Memorandum and Statement of Government Patent Policy for their guidance in determining the disposition of rights to inventions made under Government-sponsored grants and contracts. On the basis of the knowledge and experience then available, this Statement first established Government-wide objectives and criteria, within existing legislative constraints, for the allocation of rights to inventions between the Government and its contractors.

It was recognized that actual experience under the Policy could indicate the need for revision or modification. Accordingly, a Patent Advisory Panel was established under the Federal Council for Science and Technology for the purpose of assisting the agencies in implementing the Policy, acquiring data on the agencies' operations under the Policy, and making recommendations regarding the utilization of

Government-owned patents. In December 1965, the Federal Council established the Committee on Government Patent Policy to assess how this Policy was working in practice, and to acquire and analyze additional information that could contribute to the reaffirmation or modification of the Policy.

The efforts of both the Committee and the Panel have provided increased knowledge of the effects of Government patent policy on the public interest. More specifically, the studies and experience over the past seven years have indicated that:

(a) A single presumption of ownership of patent rights to Government-sponsored inventions either in the Government or in its contractors is not a satisfactory basis for Government patent policy, and that a flexible Government-wide policy best serves the public interest;

(b) The commercial utilization of Government-sponsored inventions, the participation of industry in Government research and development programs, and commercial competition can be influenced by the following factors: the mission of the contracting agency; the purpose and nature of the contract; the commercial applicability and market potential of the invention; the extent to which the invention is developed by the contracting agency; the promotional activities of the contracting agency; the commercial orientation of the contractor and the extent of his privately financed research in the related technology; and the size, nature and research orientation of the pertinent industry;

(c) In general, the above factors are reflected in the basic principles of the 1963 Presidential Policy Statement.

Based on the results of the studies and experience gained under the 1963 Policy Statement certain improvements in the Policy have been recommended which would provide (1) agency heads with additional authority to permit contractors to obtain greater rights to inventions where necessary to achieve utilization or where equitable circumstances would justify such allocation of rights, (2) additional guidance to the agencies in promoting the utilization of Government-sponsored inventions, (3) clarification of the rights of States and municipal governments in inventions in which the Federal Government acquires a license, and (4) a more definitive data base for evaluating the administration and effectiveness of the Policy and the feasibility and desirability of further refinement or modification of the Policy.

I have approved the above recommendations and have attached a revised Statement of Government Patent Policy for your guidance. As with the 1963 Policy Statement, the Federal Council shall make a continuing effort to record, monitor and evaluate the effects of this Policy Statement. A Committee on Government Patent Policy, operating under the aegis of the Federal Council for Science and Technology, shall assist the Federal Council in these matters.

This memorandum and statement of policy shall be published in the Federal Register.

RICHARD NIXON.

NOTE: The text of the memorandum was released at San Clemente, Calif.

The statement of policy mentioned in it is printed in the Federal Register of August 26, 1971 (36 F.R. 16889).

¹ U.S. President (Richard M. Nixon). Public papers of the Presidents, 1971. Washington, U.S. Govt. Print. Off., 1972, pp. 919-920.

APPENDIX K

POLICY STATEMENTS OF THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

APPENDIX K

POLICY STATEMENTS OF THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY ¹

- (1) Oct. 25, 1961----- Policy to help scientific journals meet their costs of publishing research results.
- (2) Nov. 8, 1962----- Statement regarding report on "Meeting manpower needs in science and technology" by the President's Science Advisory Committee.
- (3) Feb. 11, 1963----- Statement relating to the release of information on grants or grant-type contracts made in support of non-classified basic scientific research at non-profit institutions.
- (4) Oct. 10, 1963----- Statement of Government patent policy.
- (5) September 1964---- Policy guidance for research investment abroad by U.S. agencies.
- (6) December 1964---- U.S. agency scientific and technical representation overseas.
- (7) Sept. 13, 1965----- Strengthening academic capability for science throughout the country.
- (8) Mar. 29, 1966----- Policy of the Federal Council for Science and Technology relating to conflicts of interest by staff members of colleges and universities.
- (9) Jan. 31, 1967----- Guidelines for the Executive Agency for the U.S.-Italy Program.
- (10) March 1968----- Policies governing the foreign dissemination of scientific and technical information by agencies of the U.S. Federal Government.
- (11) June 1968----- Policy guidance for international scientific exchange programs; guidelines for participating U.S. agencies.
- (12) June 1968----- Foreign travel; support of research abroad.
- (13) Oct. 16, 1968----- Bilateral scientific agreements with Australia and Taiwan.
- (14) Nov. 13, 1968----- Payment of publication costs from Federal research grant and contract funds.
- (15) Feb. 21, 1969----- Policy on expanded use of Federal research facilities by university investigators.
- (16) July 14, 1969----- Guidelines on exchange of unclassified scientific and technical information with countries with which we do not have diplomatic relations.
- (17) July 1, 1970----- Guidelines for submitting proposals under inter-governmental science programs.
- (18) Aug. 23, 1971----- Statement of Government patent policy.
- (19) Nov. 8, 1974----- Notice of policy on page charges.
- (20) June 29, 1976----- Development of general guidelines for R&D recoupment.

¹ This compilation of policy statements was received from and approved for publication by the Federal Council for Science and Technology.

(1)

OCTOBER 25, 1961—POLICY TO HELP SCIENTIFIC JOURNALS MEET THEIR COSTS OF PUBLISHING RESEARCH RESULTS

Source: U.S. National Science Foundation. Federal research grants and contracts to allow page charges under new policy. Press release NSF 61-147, October 25, 1961. 2 p.

A new policy designed to help scientific journals meet their costs of publishing research results has been adopted by the Federal Council for Science and Technology.

Under the policy, which has been followed by some Government agencies in the past and is now standard for all, page charges for publication of scientific research results in scientific journals will be budgeted for and paid as a necessary part of research costs under Federal grants and contracts.

The policy recognizes that the results of Government-sponsored research are frequently published in journals published by non-profit organizations. Based on the premise that "the rate of scientific advance is determined in a significant measure by the speed and effectiveness with which research findings are disseminated among scientists who can use them in further research," the Council states in its policy, "the dissemination of the results of research is an integral part of the research process."

The policy further recognizes "that page charges for publishing papers in primary journals constitute one effective means by which an appropriate portion of the research dollar" can be channelled into dissemination of the results of research.

Page charges are usually calculated as a part of the cost of composition and make-up of journals. Adoption of the page charge by an increasing number of journals is recognized by the Council as a significant source of financial support for journals trying to carry rapidly increasing numbers of papers being produced by U.S. scientists.

Scientific policy representatives of Federal agencies that make up the Council established four criteria for honoring page charge bills submitted by journal publishers:

- (1) The research papers report work supported by the Government
- (2) The charges are levied impartially on all research papers published by the journal, whether by non-Government or by Government authors.
- (3) Payment of such charges is in no sense a condition for acceptance of manuscripts by the journal.
- (4) The journals involved are not operated for profit.

The new policy was stimulated by the National Science Foundation, which bears a coordinating responsibility for government scientific information policies and programs.

The Federal Council for Science and Technology was established by Executive Order 10807, in 1959, and includes representatives from the Departments of Agriculture, Commerce, Defense, Interior, and Health, Education, and Welfare, as well as from the National Aeronautics and Space Administration, the Atomic Energy Commission, and the National Science Foundation. Its purpose is to provide more effective planning and administration of Federal scientific and technological programs.

(2)

NOVEMBER 8, 1962—STATEMENT REGARDING REPORT ON "MEETING MANPOWER NEEDS IN SCIENCE AND TECHNOLOGY" BY THE PRESIDENT'S SCIENCE ADVISORY COMMITTEE.

Source: U.S. Federal Council for Science and Technology. Statement regarding report on "Meeting manpower needs in science and technology" by the President's Science Advisory Committee, November, 8, 1962, 2 p.

The successful accomplishment of a great many missions of Federal agencies critically depends on the quantity and on the quality of this Nation's scientific and technical manpower resources. The Federal Council for Science and Technology has therefore evaluated with direct interest the findings and action recommendations in the Science Advisory Committee's report, "Meeting Manpower Needs in Science and Technology—Graduate Training in Engineering, Mathematics and Physical Sciences."

The Federal Council concurs with the Committee's analysis and endorses its recommendations. The conclusion is inescapable that the Nation faces a particular shortage of highly-trained personnel. Though relatively few in number, these scientists and engineers are indispensable to scientific discovery, to vigorous and effective conversion of new knowledge to practical application, and to technical leadership essential for fulfillment of an ever-growing set of commitments. From this same base of human resources must come individuals to strengthen and expand the Nation's educational capability at all levels, and to contribute to the civilian economy in an increasingly complex society.

The Federal Council concurs with the Committee's particular emphasis on increasing the supply of engineers, mathematicians, and physical scientists with advanced training. The recommended goals are sound; and because the program is initially addressed to extending the training of students who already are in college and have selected one of these three fields for their career, it has the advantage of meeting imminent shortages promptly.

Funding of the proposed program does not involve entirely new commitments. The Federal Government already contributes significantly to the recommended goals: Of \$330 million Federal expenditures the Committee proposes for the fiscal 1964 program, \$160 million is budgeted in existing programs. The Council notes, however, that the proposed increase of \$170 million would not be spent simply by a proportionate increase in on-going programs.

All of the member agencies of the Council already support research in universities through project grants or contracts, toward meeting mission requirements of these agencies. Such project-type support yields direct benefit to the agencies by strengthening their base of scientific research, and yields indirect benefit through the training of graduate students who serve as research assistants in mission-related fields. The Council believes that agencies must continue to furnish such mission-related project support. In addition, some agencies have instituted fellowships and training grants designed more specifically to foster expansion of highly-trained manpower for the Nation's growing research and development programs.

Agencies can use all such existing mechanisms of support to implement the goals in this report, without requesting any legislative authority from the Congress. The report recommends, however, that increased emphasis be placed on the training grant mode of support. The Council concurs. Such direct support of graduate education offers universities better opportunity to balance their own programs and to strengthen their training capabilities. Also, training grants awarded competitively to existing or potential centers of educational excellence help in maintaining high quality of the institutions and of the students they attract.

The Federal Government currently sponsors about 70 per cent of the Nation's scientific research and development in industry, universities, and its own laboratories. It is consequently a primary consumer of specialized manpower resources. Moreover, higher quality of scientific manpower in the years immediately ahead is needed so that our large Federal expenditures for research and development are made prudently and without waste. In the Council's judgment, therefore, the Federal Government must assume a major responsibility for supporting this program, to assure achievement of the many national objectives for which member agencies of the Council are responsible.

The Council notes that the fiscal 1964 budget estimates now under review do not reflect the initial expenditure increment recommended in the Committee report. If the goals proposed by the Committee are to be realized, a substantial budgetary commitment will be necessary. The Council urges that a most serious effort be made to provide the necessary additional funds insofar as possible, within the framework of the President's budget policies for 1964.

If the recommended program is approved in principle by the President, existing plans relevant to the proposed EMP program would have to be reviewed immediately, and modified as necessary. The Federal Council is prepared to initiate Government-wide efforts to assure compatibility of program elements and policies among different agencies, and to integrate and coordinate agency programs that bear specifically upon graduate training in engineering, mathematics, and physical sciences.

The Science Advisory Committee has stated, and the Council agrees that while needs in engineering, mathematics, and physical sciences warrant priority attention, deficiencies in other fields and at all levels of training must be evaluated. Inadequate production of M.D.'s, for example, and shortages of facilities to meet projected undergraduate enrollments have already been brought to the Nation's attention. Further studies by the Committee will be invaluable in identifying steps that must be taken both within and without the Federal Government to meet our Nation's diverse manpower needs in science and technology.

(3)

FEBRUARY 11, 1963—STATEMENT RELATING TO THE RELEASE OF INFORMATION ON GRANTS OR GRANT-TYPE CONTRACTS MADE IN SUPPORT OF NON-CLASSIFIED BASIC SCIENTIFIC RESEARCH AT NON-PROFIT INSTITUTIONS

Source: U.S. Federal Council for Science and Technology. Statement relating to the release of information on grants or grant-type contracts made in support of non-classified basic scientific research at non-profit institutions. Feb. 11, 1963. By Jerome B. Wiesner. 1 p.

The following guidelines were adopted by the Federal Council for Science and Technology to govern the release of information relating to grants or grant-type contracts made by Federal agencies in support of non-classified basic scientific research and related educational activities at non-profit institutions. In accord with the policy of the Administration that an affirmative and conscientious effort be made to make appropriate information available to the public, as a minimum, the following actions are to be taken with respect to proposals received after those making the submissions are fully advised as to the policy to be applied. Agencies are requested to implement this policy as soon as practicable.

1. Where a proposal results in Federal financing, material submitted by the applicant outlining the individual proposal and major modifications thereof, in terms of the nature of the substantive research to be undertaken, the objectives sought, the general lines of approach and the purposes for which the funds are to be used, together with the agreements of award are, upon request, to be made available as to the public through recognized information media and, to the extent an agency deems it appropriate, to an individual member of the public. There will, however, not be included such information as the grantee or contractor and the granting agency have mutually agreed will be held in confidence. This type of information may relate to individual salaries of faculty members or such other matters as the more definitive aspects of the principal investigator's ideas and accomplishments before they are ripe for reporting.

2. Estimated budgets furnished by the agency to the institution, and reports furnished by a grantee or contractor relating to the expenditure of tax funds, and final financial reports furnished by the institution upon completion of the project are to be considered as available to the public through recognized information media and, to the extent an agency deems it appropriate, to an individual member of the public. Final technical reports prepared for publication and furnished the agency upon the completion of a project will be considered as available to the public. Other reports furnished the agency during or at the completion of a project should be considered as available to the public (as in Paragraph 1) where the agency feels that their release is appropriate. In the event the agency does not have requested details of current expenditures (such as names of participants or status of project) the agency should, where appropriate, undertake, pursuant to the terms of the agreement of award, to secure such information for release as indicated above.

While it is hoped that in most situations the above guidelines can be governing, it is, of course, recognized that on certain occasions the agency may, in the national interest, feel it undesirable to release certain information as premature or confidential. In such cases, if the agency decides to withhold information, it is, of course, the responsibility of the agency to explain, upon request, the general basis upon which the decision was made.

JEROME B. WIESNER.

(4)

OCTOBER 10, 1963—PRESIDENTIAL MEMORANDUM AND STATEMENT OF
GOVERNMENT PATENT POLICY ISSUED OCTOBER 10, 1963

Source: Federal Register, v. 28, no. 200, October 12, 1963, pp. 10943-10946.

Memorandum for the Heads of Executive Departments and Agencies

Over the years, through Executive and Legislative actions, a variety of practices has developed within the Executive Branch affecting the disposition of rights to inventions made under contracts with outside organizations. It is not feasible to have complete uniformity of practice throughout the Government in view of the differing missions and statutory responsibilities of the several departments and agencies engaged in research and development. Nevertheless, there is need for greater consistency in agency practices in order to further the governmental and public interests in promoting the utilization of federally financed inventions and to avoid difficulties caused by different approaches by the agencies when dealing with the same class of organizations in comparable patent situations.

From the extensive and fruitful national discussions of government patent practices, significant common ground has come into view. First, a single presumption of ownership does not provide a satisfactory basis for government-wide policy on the allocation of rights to inventions. Another common ground of understanding is that the Government has a responsibility to foster the fullest exploitation of the inventions for the public benefit.

Attached for your guidance is a statement of government patent policy, which I have approved, identifying common objectives and criteria and setting forth the minimum rights that government agencies should acquire with regard to inventions made under their grants and contracts. This statement of policy seeks to protect the public interest by encouraging the Government to acquire the principal rights to inventions in situations where the nature of the work to be undertaken or the Government's past investment in the field of work favors full public access to resulting inventions. On the other hand, the policy recognizes that the public interest might also be served by according exclusive commercial rights to the contractor in situations where the contractor has an established non-governmental commercial position and where there is greater likelihood that the invention would be worked and put into civilian use than would be the case if the invention were made more freely available.

Wherever the contractor retains more than a non-exclusive license, the policy would guard against failure to practice the invention by requiring that the contractor take effective steps within three years

after the patent issues to bring the invention to the point of practical application or to make it available for licensing on reasonable terms. The Government would also have the right to insist on the granting of a license to others to the extent that the invention is required for public use by governmental regulations or to fulfill a health need, irrespective of the purpose of the contract.

The attached statement of policy will be reviewed after a reasonable period of trial in the light of the facts and experience accumulated. Accordingly, there should be continuing efforts to monitor, record, and evaluate the practices of the agencies pursuant to the policy guidelines.

This memorandum and the statement of policy shall be published in the FEDERAL REGISTER.

JOHN F. KENNEDY.

STATEMENT OF GOVERNMENT PATENT POLICY

BASIC CONSIDERATIONS

A. The government expends large sums for the conduct of research and development which results in a considerable number of inventions and discoveries.

B. The inventions in scientific and technological fields resulting from work performed under government contracts constitute a valuable national resource.

C. The use and practice of these inventions and discoveries should stimulate inventors, meet the needs of the government, recognize the equities of the contractor, and serve the public interest.

D. The public interest in a dynamic and efficient economy requires that efforts be made to encourage the expeditious development and civilian use of these inventions. Both the need for incentives to draw forth private initiatives to this end, and the need to promote healthy competition in industry must be weighed in the disposition of patent rights under government contracts. Where exclusive rights are acquired by the contractor, he remains subject to the provisions of the antitrust laws.

E. The public interest is also served by sharing of benefits of government-financed research and development with foreign countries to a degree consistent with our international programs and with the objectives of U.S. foreign policy.

F. There is growing importance attaching to the acquisition of foreign patent rights in furtherance of the interests of U.S. industry and the government.

G. The prudent administration of government research and development calls for a government-wide policy on the disposition of inventions made under government contracts reflecting common principles and objectives, to the extent consistent with the missions of the respective agencies. The policy must recognize the need for flexibility to accommodate special situations.

POLICY

SECTION 1. The following basic policy is established for all government agencies with respect to inventions or discoveries made in the course of or under any contract of any government agency, subject

to specific statutes governing the disposition of patent rights of certain government agencies.

(a) Where

(1) a principal purpose of the contract is to create, develop or improve products, processes, or methods which are intended for commercial use (or which are otherwise intended to be made available for use) by the general public at home or abroad, or which will be required for such use by governmental regulations; or

(2) a principal purpose of the contract is for exploration into fields which directly concern the public health or public welfare; or

(3) the contract is in a field of science or technology in which there has been little significant experience outside of work funded by the government, or where the government has been the principal developer of the field, and the acquisition of exclusive rights at the time of contracting might confer on the contractor a preferred or dominant position; or

(4) the services of the contractor are

(i) for the operation of a government-owned research or production facility; or

(ii) for coordinating and directing the work of others, the government shall normally acquire or reserve the right to acquire the principal or exclusive rights throughout the world in and to any inventions made in the course of or under the contract. In exceptional circumstances the contractor may acquire greater rights than a non-exclusive license at the time of contracting, where the head of the department or agency certifies that such action will best serve the public interest. Greater rights may also be acquired by the contractor after the invention has been identified, where the invention when made in the course of or under the contract is not a primary object of the contract, *provided* the acquisition of such greater rights is consistent with the intent of this Section 1 (a) and is a necessary incentive to call forth private risk capital and expense to bring the invention to the point of practical application.

(b) In other situations, where the purpose of the contract is to build upon existing knowledge or technology, to develop information, products, processes, or methods for use by the government, and the work called for by the contract is in a field of technology in which the contractor has acquired technical competence (demonstrated by factors such as know-how, experience, and patent position) directly related to an area in which the contractor has an established nongovernmental commercial position, the contractor shall normally acquire the principal or exclusive rights throughout the world in and to any resulting inventions, subject to the government acquiring at least an irrevocable non-exclusive royalty free license throughout the world for governmental purposes.

(c) Where the commercial interests of the contractor are not sufficiently established to be covered by the criteria specified in Section 1(b), above, the determination of rights shall be made by the agency after the invention has been identified, in a manner deemed most likely to serve the public interest as expressed in this policy statement, taking particularly into account the intentions of the contractor to bring the invention to the point of commercial application and the guidelines of Section 1(a) hereof, *provided* that the agency may prescribe by

regulation special situations where the public interest in the availability of the inventions would best be served by permitting the contractor to acquire at the time of contracting greater rights than a non-exclusive license. In any case the government shall acquire at least a non-exclusive royalty free license throughout the world for governmental purposes.

(d) In the situation specified in Sections 1(b) and 1(c), when two or more potential contractors are judged to have presented proposals of equivalent merit, willingness to grant the government principal or exclusive rights in resulting inventions will be an additional factor in the evaluation of the proposals.

(e) Where the principal or exclusive (except as against the government) rights in an invention remain in the contractor, he should agree to provide written reports at reasonable intervals, when requested by the government, on the commercial use that is being made or is intended to be made of inventions made under government contracts.

(f) Where the principal or exclusive (except as against the government) rights in an invention remain in the contractor, unless the contractor, his licensee, or his assignee has taken effective steps within three years after a patent issues on the invention to bring the invention to the point of practical application or has made the invention available for licensing royalty free or on terms that are reasonable in the circumstances, or can show cause why he should retain the principal or exclusive rights for a further period of time, the government shall have the right to require the granting of a license to an applicant on a non-exclusive royalty free basis.

(g) Where the principal or exclusive (except as against the government) rights to an invention are acquired by the contractor, the government shall have the right to require the granting of a license to an applicant royalty free or on terms that are reasonable in the circumstances to the extent that the invention is required for public use by governmental regulations or as may be necessary to fulfill health needs, or for other public purposes stipulated in the contract.

(h) Where the government may acquire the principal rights and does not elect to secure a patent in a foreign country, the contractor may file and retain the principal or exclusive foreign rights subject to retention by the government of at least a royalty free license for governmental purposes and on behalf of any foreign government pursuant to any existing or future treaty or agreement with the United States.

SEC. 2. Government-owned patents shall be made available and the technological advances covered thereby brought into being in the shortest time possible through dedication or licensing and shall be listed in official government publications or otherwise.

SEC. 3. The Federal Council for Science and Technology in consultation with the Department of Justice shall prepare at least annually a report concerning the effectiveness of this policy, including recommendations for revision or modification as necessary in light of the practices and determinations of the agencies in the disposition of patent rights under their contracts. A patent advisory panel is to be established under the Federal Council for Science and Technology to

(a) develop by mutual consultation and coordination with the agencies common guidelines for the implementation of this policy, consistent with existing statutes, and to provide over-all guidance as to disposition of inventions and patents in which the government has any right or interest; and

(b) encourage the acquisition of data by government agencies on the disposition of patent rights to inventions resulting from federally-financed research and development and on the use and practice of such inventions, to serve as basis for policy review and development; and

(c) make recommendations for advancing the use and exploitation of government-owned domestic and foreign patents.

SEC. 4. *Definitions:* As used in this policy statement, the stated terms in singular and plural are defined as follows for the purposes hereof:

(a) Government agency—includes any Executive department, independent commission, board, office, agency, administration, authority, or other government establishment of the Executive Branch of the Government of the United States of America.

(b) Invention or Invention or discovery—includes any art, machine, manufacture, design, or composition of matter, or any new and useful improvement thereof, or any variety of plant, which is or may be patentable under the Patent Laws of the United States of America or any foreign country.

(c) Contractor—means any individual, partnership, public or private corporation, association, institution, or other entity which is a party to the contract.

(d) Contract—means any actual or proposed contract, agreement, grant, or other arrangement, or sub-contract entered into with or for the benefit of the government where a purpose of the contract is the conduct of experimental, developmental, or research work.

(e) Made—when used in relation to any invention or discovery means the conception or first actual reduction to practice of such invention in the course of or under the contract.

(f) Governmental purpose—means the right of the Government of the United States (including any agency thereof, state, or domestic municipal government) to practice and have practiced (made or have made, used or have used, sold or have sold) throughout the world by or on behalf of the Government of the United States.

(g) To the point of practical application—means to manufacture in the case of a composition or product, to practice in the case of a process, or to operate in the case of a machine and under such conditions as to establish that the invention is being worked and that its benefits are reasonably accessible to the public.

(5)

SEPTEMBER 1964, AS AMENDED DECEMBER 1964—POLICY GUIDANCE
FOR RESEARCH INVESTMENT ABROAD BY U.S. AGENCIES

Source: U.S. Federal Council for Science and Technology. Policy guidance for research investment abroad by U.S. agencies, September 1964. Prepared and submitted by the International Committee, August 7, 1964; endorsed by the Council, August 18, 1964; amended December 1964. 7 p.

STATEMENT BY THE INTERNATIONAL COMMITTEE, FEDERAL COUNCIL
FOR SCIENCE AND TECHNOLOGY¹

I. General U.S. Involvement in Science Outside the United States

The United States is involved in a wide range of scientific activities conducted in foreign countries, including investment in research conducted by foreign scientists. This involvement is a fundamental necessity, because our scientific community cannot remain aloof from the world of science without paying a penalty in terms of wasted and ineffective effort and missing new advances useful to our society.

The government of the United States, whose science activities constitute an important part of the broader total of national involvement, must be concerned with research outside this country. First, scientific progress contributes to the economic and cultural development of all countries, and in this and other ways advances the interests of the United States. Second, this involvement is essential to the attainment of the statutory objectives of a number of agencies. The following is directed to this latter aspect.

II. Involvement to Attain Agency Objectives

Today scientific excellence is widely dispersed and the programs of Federal agencies will be hampered if they remain aloof from scientific contact with foreign laboratories. Major areas of inquiry, such as oceanography, geophysics and meteorology, take meaningful form only on a broad regional or global basis.

In addition, there exist outside our borders unique opportunities in the form of natural conditions, unusual materials, unusually well-qualified people and specialized facilities. These factors which characterize the contributions from research carried on outside the United States are at the same time the criteria which define the types of foreign research with which the Federal technical agencies should be involved.

The statutory objectives of these agencies include many vital matters: defense of the Nation; protection of the health of our citizens; increase of manufacturing and agricultural productivity; enhancement of special efforts, such as scientific and industrial exploitation of nuclear phenomena and the conquest of space. Technical agencies are not involved in research outside the United States to provide assistance to other countries; this is in the province of the Department of State and the Agency for International Development.² Rather, scientific capabilities in other countries are used for the attainment of domestic missions. Agency involvement for this purpose takes the form of:

Direct overseas operations, such as tracking stations or health laboratories;

Research procurement by contract with foreign laboratories;

Collaborative arrangements with other countries; or

Investment in research of interest to U.S. through grants to foreign investigators.

¹ This statement reaffirms the basic principles stated in the Federal Council of Science and Technology report of June 20, 1961, *International Scientific and Technological Activities*, and the report of September 4, 1962 by the International Science Panel of the President's Science Advisory Committee, *Research Support Abroad through Grants and Contracts*, and amplifies them only insofar as is indicated by accumulated operating experience and changing economic circumstances in this country and abroad.

² This also becomes a matter of concern to the technical agencies since legislation as well as sound management dictate the use of technical agency capabilities in State and AID programs when appropriate. These aspects are not treated in this paper.

In addition to the usual rules of good management which help to assure the efficient use of U.S. funds, agencies are expected to limit expenditures for scientific activities abroad in light of the United States balance of payments situation. In line with present policies on minimizing U.S. outlays overseas, emphasis should be placed on encouraging foreign support of research, developing joint U.S.-foreign projects, and consideration of domestic projects in lieu of foreign ones. Agency involvement in overseas activities does not necessarily include financial assistance to foreign institutions or laboratories: the vital interest of the Federal agencies is in insuring that the research meets essential U.S. requirements, that it is done, and that it is done well. In the last few years there has been a growing ability and tendency in many countries to expand indigenous investments in research. Thus, some of our objectives are being met without the expenditure of our funds.³

III. Agency Involvement and U.S. Foreign Policy

The structure, vigor and direction of scientific development within a foreign country can be affected by:

The extent of our total involvement;

The rate of change—upward or downward—in the volume of U.S. funds invested;

The degree of concentration of these funds in individual institutions;

Specific agency administration practices; and

Compatibility of our research goals with the priorities of the foreign country.

An agency's desire to accomplish certain scientific goals is part of and in turn affects other aspects of our foreign policy objectives. A close relationship with the Department of State must be maintained to ensure the fullest accord between agency program needs and U.S. foreign policy considerations.

With the guidance of the Department of State agencies should endeavor, through consultation with appropriate officials of the foreign country, to ensure that their activities are in consonance with the general "science ecology" of the country. Agency involvement often enhances the general condition of science within the foreign country, and agencies should generally try to maximize ancillary benefits to the foreign country. Among such benefits are:

Stimulation of support for science from indigenous sources;

Strengthening of relationships within the world community of science;

Improved recognition and status for science.

In this light, agencies should take the following measures in developing foreign programs:

1. Emphasize the development of collaborative efforts involving local support of the foreign component of the program;

2. Urge that all possibilities of indigenous support for a desirable project be thoroughly explored before providing U.S. support;

3. Ensure that the administration of the grant, contract or agreement is in consonance with the prevailing policies and practices within the country.

³ This paragraph amended December 1964.

IV. International Economic Considerations of Research Support Abroad

General economic factors, in the U.S. and overseas, legitimately affect the volume of Federal money spent for research abroad. The continuing need to economize and the U.S. balance-of-payments situation are factors affecting the proper magnitude of investment in overseas science.

Grants or contracts for research outside this country are justified in advanced countries because a generally favorable economic situation in a foreign country does not in itself ensure that research of high priority to Federal agencies will be given a high priority by the foreign country. Also, there is no assurance that cessation of U.S. support of specific research in a country will result in the financing of that research by that country. The proper course of action in this circumstance is to press for expansion of research support by the foreign country, but to bear in mind the importance to the U.S. of ensuring that selected research is indeed carried forward.

V. Administration of Research Investment Abroad

Several practices and policies should be adopted by the agencies:

Relevance to missions

1. Foreign research support should be limited to projects which are of the highest relevance to an agency's mission and which can be carried out more effectively outside this country.

Efficient and economical administration

2. Administrators have a responsibility to obtain the best research at the lowest cost and to inculcate cost consciousness on their staffs.

3. Foreign research agreements should: provide payment for indirect costs only when necessary; include practicable "Buy American" clauses; minimize payment for international travel; provide payment in excess U.S.-owned foreign currencies whenever possible; exclude payments for import duties on equipment or supplies.

4. Grants or contracts should normally make use of existing facilities as opposed to creating major new foreign-owned facilities.

5. Individual projects involving large sums of money (e.g., \$100,000 or more) should be formally reviewed by a higher level in the agency than that normally involved.

6. Research funds should be made available in advance only if necessary to the orderly progress of the work, and then in the minimum amounts required.

7. Research agreements should have the minimum duration required for effective prosecution of the work, and extension of support should be based on a careful review of the work to date.

VI. General Limits on Agencies' Foreign Research Expenditures

Where the scale of an Agency's support of foreign research warrants it, the total amount of money which each agency should devote in each year to financing of research outside the United States should be derived from a carefully designed plan for such activities. This

plan should spell out the considerations which require the agency to become involved with scientists and research in other countries. It should deal with the totality of the involvement, and not be limited to those aspects of the relationships which involve expenditures. The plan should spell out details for the near future, and provide general operating principles and a guiding philosophy for the more remote future. The plan should also provide dollar levels of support, proposing specific levels for the near future and reasonable ranges for the more remote future. The missions of the agencies, and the nature and degree of their involvement with science outside the United States, vary so widely that the plans of the agencies will also vary widely, but such plans must, in all cases, take into account the seriousness of the balance of payments situation.

As part of the process of budget formulation, plans should be made known to the Bureau of the Budget in appropriate detail and at appropriate intervals. The following principles are relevant in judging the proper magnitude of research expenditures abroad:

1. The choice of an agency to spend its research funds in the United States or outside the United States is basically a technical program decision, and other considerations are secondary.

2. Financing of research outside the United States may be a species of foreign aid where the agency charter permits, but for technical agencies, it is a means of attaining agency objectives.

3. Economic conditions in this and other countries legitimately affect but should not solely govern the level of research expenditures outside the United States.

4. Changes upward or downward in the level of support for research in foreign countries should be gradual.

Scrutiny of agency plans, to ensure that the criteria stated in this document are in fact observed, is a proper part of the budgetary process, and is expected from the operating agencies.

VII. Additional Aspects of Agency Involvement in Foreign Research

Although Federal agencies become involved in research in other countries to further their statutory missions, this involvement can yield ancillary benefits to this country:

Furthering our foreign policy objectives through increasing international scientific contacts, developing common goals with other nations, enhancing the image of U.S. science abroad and by assisting developing nations;

Strengthening our general security by ensuring a strong scientific base in allied countries;

Contributing to our long-term goal of bettering man's intellectual and material well-being;

Enhancing the opportunities for advanced training of U.S. scientists in research facilities outside the U.S.

Agencies should administer their foreign scientific programs and activities so as to obtain maximum contribution from these ancillary benefits.

Conversely, agency support of research abroad should not hinder the development of U.S. capabilities and facilities in the same field. Care must be taken that this research support enhances rather than inhibits the development of American science.

DECEMBER 1964—U.S. AGENCY SCIENTIFIC AND TECHNICAL REPRESENTATION OVERSEAS ¹

Source: U.S. Department of State. Office of International Scientific Affairs. U.S. agency scientific and technical representation overseas. [December 1964]. 4 p.

The Secretary of State, working through the various bureaus and offices of that Department, is the principal agent of the President in the execution of foreign policy and the conduct of foreign relations. Through its Missions abroad, the Department of State is responsible for representing all of the interests of the United States. By delegation of authority from the President, the Chief of Mission at each post is responsible for the activities of all U.S. Government representatives in his area. In recent years there has been a steady increase of worldwide participation in the activities of science and of involvement of scientific and technological matters in international and diplomatic relations. Science has become a major concern to our Embassies abroad.

In most Embassies, matters related to international scientific affairs are handled on a part-time basis by non-specialized diplomatic officers of the Foreign Service of the United States. At some posts, however, scientific activities have expanded so greatly and the involvement with the foreign scientific community has become so broad that the representation of U.S. interests in the field of science and technology requires the assignment of a scientific or technical specialist who can devote full time and attention to these matters. These specialists are designated as Science Officers with appropriate diplomatic titles.

In addition, a number of U.S. agencies with scientific and technological interests have felt the need: (1) to work abroad in close relationship to programs within their mission; (2) to associate with foreign scientists and engineers or institutions working in cooperation with the agency through grants and contracts; (3) to operate abroad when essential to the basic mission of the agency; and (4) to obtain more information about foreign scientific efforts which complement their mission. These responsibilities have been carried out by the assignment of agency representatives abroad with the concurrence of the Department of State. Such individuals assigned to an Embassy normally will be a part of the Scientific Attache's Office.² This will provide better Embassy organization and assure that they receive proper foreign policy direction and allow their participation in the objectives of the U.S. Mission.

It is necessary to limit the number of people reporting directly to the Ambassador or his Deputy. In the fields of science and technology, the Scientific Attache shall serve as a designated channel from the Ambassador to provide foreign policy guidance to other scientific and

¹ This paper has been developed in collaboration with and approved by the International Committee of the Federal Council for Science and Technology, December 1964.

² This arrangement pertains to those representatives who are serving abroad in a scientific-administrative capacity as agent for their agency within a particular country or region. It does not pertain to those other agency employees who are working members of specialized scientific research programs overseas which are not administratively attached to an Embassy.

technological representatives. The Scientific Attache shall also function as the principal channel to the Ambassador for keeping him advised of U.S. scientific and technological interests and activities within the country. This shall not preclude direct access of other agency representatives to the Chief of Mission in special circumstances or at the Chief of Mission's desire. These arrangements are designed as facilitative, and not as supervisory, for the work of other agency representatives.

For the Scientific Attache to be an effective channel to the Chief of Mission on science matters, other agency representatives should keep him informed of their activities and the interests of their agencies. The Scientific Attache will in turn keep other agency representatives informed of his activities and interests and pertinent foreign policy considerations. Procedures to accomplish this objective are best worked out in each individual case between the Scientific Attache and the agency representative. The Attache and the other agency representatives working as a science team can make a maximum contribution to the mission of the post and to the objectives of U.S. science.

When agency representatives have regional responsibilities appropriate relationships will be established with the Embassies involved.

It is hoped that other agency representatives would assist the Embassy, as time permits, with those scientific and technological activities which serve the international objectives of the United States and which are related to their individual technical competence.

(7)

SEPTEMBER 14, 1965—STRENGTHENING ACADEMIC CAPABILITY FOR SCIENCE THROUGHOUT THE COUNTRY

Source: U.S. President (Lyndon B. Johnson). Statement by the President to the Cabinet and memorandum on strengthening academic capability for science, Sept. 14, 1965. Public papers of the Presidents, 1965. pp. 995-998

Throughout the postwar years, it has been my abiding and actively-supported conviction that the policies of this Nation in support of the advance of science would have a decisive role in determining the extent to which we fulfill our potential as a Nation—and a free society.

On occasion, during these years, there have appeared attitudes almost medieval in their myopia toward the meaning and promise of the growth of human knowledge. Happily, these attitudes have not prevailed and our national policies have been guided by reason, light, and faith in the future of man. As a result, American science today leads the world—free, unfettered, and devoted to the ends of bettering the condition of man in every land.

I say this, by way of preface, because I am proud of the part I have been privileged to play—in Congress and as Vice President—in opening the doors through which we have moved to some of our most significant scientific gains. Now, in this Office I am determined that we shall marshal our resources and our wisdom to the fullest to assure the continuing strength and leadership of American science and to

apply the information yielded by its inquiry to the problems which confront our society and our purposes in the world.

Our policies and attitudes in regard to science cannot satisfactorily be related solely to achievement of goals and ends we set for our research. Our vision in this regard is limited at best. We must, I believe, devote ourselves purposefully to developing and diffusing—throughout the Nation—a strong and solid scientific capability, especially in our many centers of advanced education. Our future must rest upon diversity of inquiry as well as the universality of capability.

This is very much a concern and a responsibility of the Federal Government and all the departments and agencies of the executive branch.

Today the Federal Government is spending \$15 billion annually on research and development activities. Nine percent of this—\$1.3 billion—is being spent in our universities on research grants and contracts. Additional sums are spent for educational purposes such as fellowship or training grants and the programs provided by the Higher Education Facilities Act or the National Defense Education Act.

The impact of these Federal funds is significant. They account for about two-thirds of the total research expenditures of colleges and universities. The manner in which such funds are spent clearly has a most important effect upon advanced education in this country and upon the future of our Nation's universities.

Almost all of the Federal research money is provided to produce results that are needed now and in the future to achieve our many national goals in health, in defense, in space, in agriculture, and so on. Of the total provided to universities, 34 percent comes from the National Institutes of Health, 23 percent from the Department of Defense, 9 percent from NASA, 6 percent from the AEC, and 4 percent from Agriculture. Only 13 percent is provided by the National Science Foundation—the only agency which supports science and science education as such.

The purpose of the new policy statement I am issuing today is to insure that our programs for Federal support of research in colleges and universities contribute more to the long-run strengthening of the universities and colleges so that these institutions can best serve the Nation in the years ahead.

At present, one-half of the Federal expenditures for research go to 20 major institutions, most of which were strong before the advent of Federal research funds. During the period of increasing Federal support since World War II, the number of institutions carrying out research and providing advanced education has grown impressively. Strong centers have developed in areas which were previously not well served. It is a particular purpose of this policy to accelerate this beneficial trend since the funds are still concentrated in too few institutions in too few areas of the country. We want to find excellence and build it up wherever it is found so that creative centers of excellence may grow in every part of the Nation.

Under this policy more support will be provided under terms which give the university and the investigator wider scope for inquiry, as contrasted with highly specific, narrowly defined projects. These and many more actions will increase the capacity of our universities to

produce well-trained scientists and to serve as a source of the ideas on which our national welfare depends.

By adopting this policy, I am asking each agency and department with major research responsibilities to reexamine its practices in the financing of research. I want to be sure that, consistent with agency missions and objectives, all practical measures are taken to strengthen the institutions where research now goes on, and to help additional institutions to become more effective centers for teaching and research.

Memorandum for heads of departments and agencies:

A strong and vital educational system is an essential part of the Great Society. In building our national educational system, we must bear in mind all of the parts, and all of the levels—from Head Start for preschool children to the most advanced university levels. At the apex of this educational pyramid, resting on the essential foundation provided for the lower levels, is the vital top segment where education and research become inseparable. The Federal Government has supported academic research in agriculture for over a half century and in the physical sciences, life sciences, and engineering since World War II; the returns on this national investment have been immense.

Of the \$15 billion which the Federal Government is spending in research and development activities this year, \$1.3, or about 9 percent, is spent in universities. The \$1.3 billion, which includes only Federal research grants and contracts, accounts for about two-thirds of the total research expenditures of our American colleges and universities. Over 25,000 graduate students in engineering, mathematics, physical and life sciences are supported indirectly by employment under these research grants and contracts. Plainly the Federal expenditures have a major effect on the development of our higher educational system.

The strength of the research and development programs of the major agencies, and hence their ability to meet national needs, depends heavily upon the total strength of our university system. Research supported to further agency missions should be administered not only with a view to producing specific results, but also with a view to strengthening academic institutions and increasing the number of institutions capable of performing research of high quality.

The functions of the Federal agencies in relation to the strengthening of academic institutions are as follows:

a. The National Science Foundation continues to have responsibility for augmenting the research capabilities of academic institutions in all fields of science through the support of basic research and research facilities and through measures for improving the quality of education in the sciences;

b. The Department of Health, Education, and Welfare will contribute to the overall development of colleges and universities and to the development of health professional schools, particularly through programs of the Office of Education and the Public Health Service;

c. All Federal agencies with substantial research and development programs have an interest and need to develop academic capabilities for research and scientific education as a part of their research missions.

To the fullest extent compatible with their primary interests in specific fields of science, their basic statutes, and their needs for research results of high quality, all Federal agencies should act so as to:

a. Encourage the maintenance of outstanding quality in science and science education in those universities where it exists;

b. Provide research funds to academic institutions under conditions affording them the opportunity to improve and extend their programs for research and science education and to develop the potentialities for high quality research of groups and individuals, including capable younger faculty members;

c. Contribute to the improvement of potentially strong universities through measures such as:

—Giving consideration, where research capability of comparable quality exists, to awarding grants and contracts to institutions not now heavily engaged in Federal research programs;

—Assisting such institutions or parts of institutions in strengthening themselves while performing research relevant to agency missions, by such means as establishing university-administered programs in specialized areas relevant to the missions of the agencies.

Funds for these purposes should be provided on a scale and under conditions appropriate to the mission of an agency and in accordance with any Government-wide policy guidelines which may be established.

Departments and agencies should carefully assess the degree to which and the manner in which their existing programs support this policy, and when indicated, should use a larger proportion of their research funds in accordance with the intent of the policy. The means for attaining this objective will be determined by each department and agency. In carrying out the policy, the various Federal agencies supporting research at a university should act in concert to a greater degree in making decisions, so as to make the university better able to meet the collective needs of the agencies and to make the Federal support most effective in strengthening the university.

My Special Assistant for Science and Technology, Dr. Donald Hornig, with the help of the Federal Council for Science and Technology, will follow the response of the departments and agencies to this policy. I have asked him to obtain monthly progress reports and submit them to me.

LYNDON B. JOHNSON.

(8)

MARCH 29, 1966—POLICY RELATING TO CONFLICTS OF INTEREST BY STAFF MEMBERS OF COLLEGES AND UNIVERSITIES

Source: U.S. Federal Council for Science and Technology. Policy of the Federal Council for Science and Technology relating to conflicts of interest by staff members of colleges and universities (adopted March 29, 1966). 2 p. (Attachment: On preventing conflicts of interest in government-sponsored research at universities; a joint statement of the Council of the American Association of University Professors and the American Council on Education, December 1964. Published by the American Council on Education.)

1. Federal agencies need reasonable assurance that staff members of colleges and universities are not placed in conflicts of interest situations associated with Federal research grant or contract funds. To this end, the Federal Council for Science and Technology endorses the following principles relating to potential conflicts of interest

involving staff members of colleges and universities that receive Federal research grants or contracts:¹

a. The statement, *On Preventing Conflicts of Interest in Government-Sponsored Research at Universities* (A Joint Statement of the Council of the American Association of University Professors and the American Council on Education, December, 1964) contains guides that are sound from the viewpoint of the Federal agencies, and colleges and universities are urged to adopt them.

b. Each college and university receiving Federal research grant or contract funds should have written guides for staff members (administrators, faculty members, professional staff or employees) indicating the conditions under which outside activities are proper, and providing for notification of these activities to a responsible representative of the university.

2. The Office of Science and Technology will periodically notify the agencies of those institutions whose policies are in substantial conformity with the principles in paragraph 1, and the agencies will not make separate inquiries into the policies and practices of these institutions.

3. OST will coordinate the approach of the agencies to those institutions whose policies and practices do not appear to be satisfactory.

4. When a Federal agency has reason to believe that individuals in an institution with satisfactory policies are not observing the institution's policies and procedures, the agency will take such action as it deems necessary. OST will be consulted in such cases when it appears that more than one agency may be involved.

5. The progress of voluntary establishment of institutional policies and practices will be monitored by OST, which will, if necessary, consider further steps after a reasonable interval.

ATTACHMENT

ON PREVENTING CONFLICTS OF INTEREST IN GOVERNMENT-SPONSORED RESEARCH AT UNIVERSITIES

The increasingly necessary and complex relationships among universities, Government, and industry call for more intensive attention to standards of procedure and conduct in Government-sponsored research. The clarification and application of such standards must be designed to serve the purposes and needs of the projects and the public interest involved in them and to protect the integrity of the cooperating institutions as agencies of higher education.

The Government and institutions of higher education, as the contracting parties, have an obligation to see that adequate standards and procedures are developed and applied; to inform one another of their respective requirements; and to assure that all individuals participating in their respective behalfs are informed of and apply the standards and procedures that are so developed.

Consulting relationships between university staff members and industry serve the interests of research and education in the university. Likewise, the transfer of technical knowledge and skill from the university to industry contributes to technological advance. Such rela-

¹ Staff of university-operated, government-owned facilities on government-owned or leased land not covered by these guides.

tionships are desirable, but certain potential hazards should be recognized.

A. CONFLICT SITUATIONS

1. *Favoring of outside interests.* When a university staff member (administrator, faculty member, professional staff member, or employee) undertaking or engaging in Government-sponsored work has a significant financial interest in, or a consulting arrangement with, a private business concern, it is important to avoid actual or apparent conflicts of interest between his Government-sponsored university research obligations and his outside interests and other obligations. Situations in or from which conflicts of interest may arise are the:

a. Undertaking or orientation of the staff member's university research to serve the research or other needs of the private firm without disclosure of such undertaking or orientation to the university and to the sponsoring agency;

b. Purchase of major equipment, instruments, materials, or other items for university research from the private firm in which the staff member has the interest without disclosure of such interest;

c. Transmission to the private firm or other use for personal gain of Government-sponsored work products, results, materials, records, or information that are not made generally available. (This would not necessarily preclude appropriate licensing arrangements for inventions, or consulting on the basis of Government-sponsored research results where there is significant additional work by the staff member independent of his Government-sponsored research);

d. Use for personal gain or other unauthorized use of privileged information acquired in connection with the staff member's Government-sponsored activities. (The term "privileged information" includes, but is not limited to, medical, personnel, or security records of individuals; anticipated material requirements or price actions; possible new sites for Government operations; and knowledge of forthcoming programs or of selection of contractors or subcontractors in advance of official announcements);

e. Negotiation or influence upon the negotiation of contracts relating to the staff member's Government-sponsored research between the university and private organizations with which he has consulting or other significant relationships;

f. Acceptance of gratuities or special favors from private organizations with which the university does or may conduct business in connection with a Government-sponsored research project, or extension of gratuities or special favors to employees of the sponsoring Government agency, under circumstances which might reasonably be interpreted as an attempt to influence the recipients in the conduct of their duties.

2. *Distribution of effort.* There are competing demands on the energies of a faculty member (for example, research, teaching, committee work, outside consulting). The way in which he divides his effort among these various functions does not raise ethical questions unless the Government agency supporting his research is misled in its understanding of the amount of intellectual effort he is actually devoting to the research in question. A system of precise time accounting is incompatible with the inherent character of the work of a faculty

member, since the various functions he performs are closely inter-related and do not conform to any meaningful division of a standard work week. On the other hand, if the research agreement contemplates that a staff member will devote a certain fraction of his effort to the Government-sponsored research, or he agrees to assume responsibility in relation to such research, a demonstrable relationship between the indicated effort or responsibility and the actual extent of his involvement is to be expected. Each university, therefore, should—through joint consultation of administration and faculty—develop procedures to assure that proposals are responsibly made and complied with.

3. *Consulting for Government agencies or their contractors.* When the staff member engaged in Government-sponsored research also serves as a consultant to a Federal agency, his conduct is subject to the provisions of the Conflict of Interest Statutes (18 U.S.C. 202–209 as amended) and the President's memorandum of May 2, 1963, *Preventing Conflicts of Interest on the Part of Special Government Employees*. When he consults for one or more Government contractors, or prospective contractors, in the same technical field as his research project, care must be taken to avoid giving advice that may be of questionable objectivity because of its possible bearing on his other interests. In undertaking and performing consulting services, he should make full disclosure of such interests to the university and to the contractor insofar as they may appear to relate to the work at the university or for the contractor. Conflict of interest problems could arise, for example, in the participation of a staff member of the university in an evaluation for the Government agency or its contractor of some technical aspect of the work of another organization with which he has a consulting or employment relationship or a significant financial interest, or in an evaluation of a competitor to such other organization.

B. UNIVERSITY RESPONSIBILITY

Each university participating in Government-sponsored research should make known to the sponsoring Government agencies:

1. The steps it is taking to assure an understanding on the part of the university administration and staff members of the possible conflicts of interest or other problems that may develop in the foregoing types of situations, and

2. The organizational and administrative actions it has taken or is taking to avoid such problems, including:

- a. Accounting procedures to be used to assure that Government funds are expended for the purposes for which they have been provided, and that all services which are required in return for these funds are supplied;

- b. Procedures that enable it to be aware of the outside professional work of staff members participating in Government-sponsored research, if such outside work relates in any way to the Government-sponsored research;

- c. The formulation of standards to guide the individual university staff members in governing their conduct in relation to outside interests that might raise questions of conflicts of interest; and

d. The provision within the university of an informed source of advice and guidance to its staff members for advance consultation on questions they wish to raise concerning the problems that may or do develop as a result of their outside financial or consulting interests, as they relate to their participation in Government-sponsored university research. The university may wish to discuss such problems with the contracting officer or other appropriate Government official in those cases that appear to raise questions regarding conflicts of interest.

The above process of disclosure and consultation is the obligation assumed by the university when it accepts Government funds for research. The process must, of course, be carried out in a manner that does not infringe on the legitimate freedoms and flexibility of action of the university and its staff members that have traditionally characterized a university. It is desirable that standards and procedures of the kind discussed be formulated and administered by members of the university community themselves, through their joint initiative and responsibility, for it is they who are the best judges of the conditions which can most effectively stimulate the search for knowledge and preserve the requirements of academic freedom. Experience indicates that such standards and procedures should be developed by joint administrative-faculty action.

(9)

JANUARY 31, 1967—GUIDELINES FOR THE EXECUTIVE AGENCY FOR THE U.S.-ITALY PROGRAM

Source: U.S. Federal Council for Science and Technology. The U.S.-Italy exchange program. Excerpt from minutes of meeting of January 31, 1967, concurring in draft statement of Jan. 23, 1967, by the International Committee, Guidelines for the executive agency for the U.S.-Italy program.

* * * * *

d. *The U.S.-Italy Exchange Program*

The Council concurred with the terms of the "Guidelines for the Executive Agency for the U.S.-Italy Program" as presented by Mr. Pollack.

The Council agreed that it would be desirable to establish a mechanism which would provide regularly for reports on the scientific relationships of the United States with foreign countries, by country. The International Committee was asked to present at the February meeting of the Council the preliminary specifications for such a mechanism. The desirability and feasibility of establishing a clearing house for such relationships will also be considered by the International Committee.

* * * * *

Draft—1/23/67.

GUIDELINES FOR THE EXECUTIVE AGENCY FOR THE U.S.-ITALY PROGRAM

1. The Executive Agency serves as the U.S. coordinator for implementation of the U.S.-Italy Program of Scientific Cooperation under this agreement, subject to the foreign policy guidance of the Department of State. It cooperates with all Federal agencies participating in the program as described in more detail below.

2. The Executive Agency is the channel of communication with its Italian counterpart (designated by the Government of Italy) concerning scientific and administrative aspects of the program and the establishment of individual cooperative arrangements within the program. Communications of a formal, government-to-government nature will continue to be handled through normal diplomatic channels.

3. It is intended that this program will not substitute for existing and future associations and relationships (e.g., in atomic energy, space, and biomedical research) between agencies and scientists of the two countries for the development and execution of cooperative scientific projects. The Executive Agency will encourage the development of such associations and of an environment that promotes further cooperative ventures.

4. The program is based on the understanding that both sides must approve any cooperative arrangements to be made within it. The Executive Agency acts for the U.S. in approving proposed projects. In the case of projects requiring implementation or funding by other U.S. Government agencies, arrangements with the Italian executive agency will be made in coordination with the U.S. agencies most directly concerned. The inclusion of any project in the program will require concurrence of the Executive Agency, and the implementing and funding agencies.

5. The Executive Agency encourages other agencies and scientists outside the government to develop proposals for appropriate cooperative activities, and may itself initiate ideas for such activities.

6. The Executive Agency is responsible for ensuring that each proposal for a cooperative arrangement receives appropriate review on the U.S. side, including consideration of scientific merit, feasibility, funding and appropriateness of the activity for inclusion within the program and appropriateness to the agencies concerned. Review shall be carried out by the Executive Agency and by other U.S. agencies, as appropriate, at the request of the Executive Agency.

7. Arrangements with their Italian counterparts for specific projects under the program will be made by the U.S. implementing and funding agencies. Each activity, once established as a part of the program, shall be monitored by the Executive Agency to assure that it is being carried forward in conformity with the spirit of the program as a whole. However, the implementing and funding agencies shall administer the projects in accordance with their normal procedures, augmented by such reports as may be required by the Executive Agency.

8. The Executive Agency is expected to keep abreast of other U.S. Government scientific activities with Italy, in view of their possible bearing on this program.

9. The Executive Agency shall prepare at least annually a report on all activities within the program evaluating its progress and prospects and should circulate it to all interested U.S. agencies.

MARCH 1968—POLICIES GOVERNING THE FOREIGN DISSEMINATION OF SCIENTIFIC AND TECHNICAL INFORMATION BY AGENCIES OF THE U.S. FEDERAL GOVERNMENT

Source: U.S. Federal Council for Science and Technology. Policies governing the foreign dissemination of scientific and technical information by agencies of the U.S. Federal Government. March 1968. 3 p.

I. PURPOSE

The purpose of this paper is to establish a uniform set of policies governing the dissemination of scientific and technical information to foreign States and entities, so that the best interests of the United States may be served by individual or collective activities of U.S. Federal Agencies.

II. DEFINITION

Scientific and technical information is defined as unclassified, unlimited, non-proprietary information of a scientific or technical nature, covering natural, social, and information sciences, which is generated by U.S. Federal Government facilities, contractors, or grantees, and which is releasable to foreign countries under the terms of the Munitions and Export Control Acts and regulations, and is available to the U.S. public. Scientific and technical information specifically includes reports, serials, machine readable information, and machine software used in conjunction with Federally-owned or operated machine systems or their components.

III. SCOPE

Policy statements in this document apply to all U.S. Federal Government international activities concerned with scientific and technical information, and specifically include international, bilateral or multilateral exchanges and agreements, acquisition of foreign documents, foreign dissemination of U.S. scientific and technical reports and serials in both full copy and microform; exchanges of machine indexes, machine software, specialist information personnel; and utilization of foreign machine systems.

IV. APPLICABILITY

Policy statements in this paper apply to all agencies and departments of the U.S. Federal Government and their contractors, but exclude individuals in the U.S. Federal Government Agencies or contractor personnel engaged in personal exchanges of open and unclassified information with similar individuals in foreign countries.

V. OBJECTIVES

Policy statements in this paper are designed to advance the missions of the U.S. Federal Government agencies, the overall foreign policy of the United States, and specific national objectives in the field of scientific and technical information, including but not limited to the following:

1. To ensure that there exists within the United States at least one accessible copy of each significant publication of the worldwide scientific and technical literature.

2. To establish international scientific and technical information systems through which the worldwide scientific and technical literature will flow routinely into the U.S. elements of the systems.

3. To influence and encourage the establishment of standards so that foreign information systems and those of the U.S. are compatible.

4. To utilize scientific and technical information effectively in support of agency missions, and in support of overall U.S. objectives in raising the economic and industrial standards of other nations.

VI. POLICIES

1. The United States Government seeks the widest possible dissemination of knowledge and, in particular, the open exchange of scientific and technical information.

2. Agencies of the U.S. Federal Government shall generally, in exchanging information, seek a reasonable return, which may be in the form of publications, information, materials, services or money. Agencies of the U.S. Federal Government will generally refrain from wide-spread free distribution of material, but they shall take into account the capability of the foreign entity concerned to make this return, and are encouraged to supply or distribute free materials in support of specific foreign policy objectives, such as assistance to developing countries. They may, at their own option, answer requests with free materials, and may utilize selected free distribution as necessary for accomplishment of their statutory missions.

3. Where international cooperation is sought to assist in attainment of the objectives described in V., above, preference shall normally be accorded to multilateral arrangements if they provide means at least as effective as bilateral arrangements.

4. Agencies of the U.S. Federal Government shall promote international agreement on the use of the most commonly used language for scientific and technical communication. At present, that language is English.

5. Agencies of the U.S. Federal Government shall, as appropriate, encourage the participation of qualified citizens of the United States in the official structure of international organizations concerned with scientific and technical information.

6. Agencies that qualify as lead agencies of the U.S. Federal Government in various scientific or technical subject matter fields, such as nuclear energy, agriculture, and health, have primary responsibility for meeting U.S. objectives which apply to their subject matter area. However, in the conduct of their international scientific and technical information activities, the agencies shall be subject to the foreign policy guidance of the Department of State.

7. Agencies of the U.S. Federal Government shall maintain adequate lists and statistics on international exchanges so that progress toward U.S. objectives may be estimated annually.

8. Lead agencies in specific subject areas will assume responsibility for keeping other agencies informed of any significant development in their relationships with other nations or international organiza-

tions, including proposed international activities of a significant or precedental nature.

9. Exchanges, arrangements, and agreements with the nations of Eastern Europe, the U.S.S.R. and unrecognized regimes proposed by the agencies of the U.S. Federal Government shall be coordinated in advance with Department of State, subject to the regulations established for such exchanges.

10. Policies contained in this paper shall not be construed as superseding any statute or Executive Order.

(11)

JUNE 1968—POLICY GUIDANCE FOR INTERNATIONAL SCIENTIFIC EXCHANGE PROGRAMS: GUIDELINES FOR PARTICIPATING U.S. AGENCIES

Source: U.S. Federal Council for Science and Technology. Memorandum for Herman Pollack, Chairman, International Committee, from Charles V. Kidd, Executive Secretary, of August 1, 1968, with attachment, International scientific exchange programs: guidelines for participating U.S. agencies. 1 p. and 4 p. Submitted by the International Committee, June 17, 1968; endorsed by the Council, Aug. 1, 1968.

MEMORANDUM FOR HERMAN POLLACK, CHAIRMAN, INTERNATIONAL COMMITTEE, FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

We have heard from all of the Federal agencies, and there are no objections to the International Committee's report, "Policy Guidance for International Scientific Exchange Programs: Guidelines for Participating U.S. Agencies, June 1968." This report can be considered as approved by the Federal Council.

CHARLES V. KIDD,
Executive Secretary.

ATTACHMENT

INTERNATIONAL SCIENTIFIC EXCHANGE PROGRAMS: GUIDELINES FOR PARTICIPATING U.S. AGENCIES

A. STATEMENT OF PURPOSE

The basic purposes of the United States Government in supporting international educational and cultural exchange programs, are to increase understanding between the people of the U.S. and of other countries, to strengthen the ties which unite us with other nations, and to promote international cooperation for educational and cultural advancement. Scientific and technological exchanges (including pertinent equipment) with other nations can help to achieve these broad objectives. They should be formulated with regard both to their scientific objectives and their place in the framework of these more generalized foreign policy objectives.

B. SPECIFIC PRECEPTS

1. It is the policy of the United States Government to encourage international scientific and technological exchange programs.

2. In these programs the merit of the project and of the individual scientist or technician is of primary importance. However, it is also recognized that scientific collaboration including cooperative research frequently can lead to long-standing and beneficial institutional relationships. Therefore, wherever feasible, exchanges should be planned so that key people, key departments of study, and key institutions join in long-lasting relationships.

3. Exchanges with developing countries are matters of special interest because of the effect these programs have on the enhancement of a scientific and technical base in those countries. U.S. agency management of exchange programs should be designed to avoid the permanent movement of scientific and technical personnel to the United States when such movement would constitute significant loss for the developing nations. Therefore, to the degree feasible:

a. National and regional educational and research institutions in the developing countries should be strengthened, rather than having foreign scientists, technicians, and physicians trained only in the United States. In this connection, it is noted that such concepts as the development of "sister institutions" (laboratories, libraries, etc.) can contribute to the strengthening of the foreign facility, even though the foreign scientist or scholar is trained in the U.S. "Sister institution" means an arrangement by which continuing access to a U.S. facility is offered, while the foreign facility devotes yearly a portion of its budget to the upkeep of the sister relationship.

b. Modernization is to be stimulated through widening the educational base. For example, exchange programs could develop resource personnel who could in turn teach others.

c. Foreign governments should be encouraged to pursue recruiting efforts with their own citizens resident in the U.S. whose skills are needed at home.

d. It is desirable to give the exchange visitor background and experience pertinent to his professional activities in his country.

4. The participating U.S. agency should try to provide exchange visitors with opportunities to broaden their experience in the U.S. beyond that of the immediate project in the exchange program. The objective is to help develop mutual sympathetic understanding of the national character and objectives of the U.S. and the participant's country. The Department of State will cooperate in developing activities which might facilitate achieving this objective.

C. REPORTING

Each agency concerned should provide the International Committee of the Federal Council for Science and Technology with an annual overall report on its exchange programs and the steps which are consistent with these Guidelines.

The International Committee of the Federal Council for Science and Technology will meet annually with the relevant agencies to discuss their programs as they relate to the Guidelines. The minutes of this meeting will provide the means for the annual overall report on the exchange programs under these Guidelines.

JUNE 1968—FOREIGN TRAVEL; SUPPORT OF RESEARCH ABROAD

Source: U.S. Department of State. Letter to Dr. Donald F. Hornig, Chairman, Federal Council for Science and Technology, of June 10, 1968, from Herman Pollack, Chairman, International Committee "summariz[ing] the [International] Committee's view on foreign travel and support of research abroad which have been verbally reported to the Council."

DEAR DON: With the approval of the International Committee I would like to summarize the Committee's view on foreign travel and support of research abroad which have been verbally reported to the Council.

FOREIGN TRAVEL

A survey of agencies concerned with the foreign travel of scientists and engineers has revealed that at this point in time there is no clear indication that a temporary 25% reduction will result in serious harm to our scientific progress, leadership, or prestige. The potential for impairment of these factors is recognized, however, particularly if the travel restrictions are continued over an extended period. The International Committee will continue to monitor the situation, to consult together on travel policies and conference priorities, and to make whatever recommendations appear indicated to the Council when appropriate. For the present, BOB Bulletin 68-8 provides adequate guidance for Government-supported foreign travel of scientists and engineers.

The uniform, fair, and reasonable administration of the BOB guidance is, however, essential both for the progress of science and the maintenance of constructive working relationships between agencies of the government and members of the scientific community.

RESEARCH ABROAD

As reported to the March 5, 1968 meeting of the Council, the existing "Guidelines for the Support of Research Abroad by U.S. Agencies" have been reviewed by the Committee; no changes were considered advisable. The Guidelines were drawn in 1964, in response to the concern at that time over an unfavorable balance of payments. The Guidelines are still current, and are adequate to the present concern. The International Committee has recommended that whenever U.S. support to specific research projects in other countries is withdrawn, it should be done in a manner that would permit necessary adjustments within research programs or the location of other sources of funds for a given project.

Sincerely,

HERMAN POLLACK,
*Chairman, International Committee
 of the Federal Council for
 Science and Technology.*

OCTOBER 16, 1968—BILATERAL SCIENTIFIC AGREEMENTS WITH AUSTRALIA AND TAIWAN

Source: U.S. Department of State. International Scientific and Technological Affairs. Memorandum to all members of Federal Council for Science and Technology from Herman Pollack, February 28, 1969, subject: Bilateral scientific agreements with Australia and Taiwan. 1 p. Attachment: Bilateral scientific agreement with Australia, signed and entered into force, Oct. 16, 1968. 3 p.

Bilateral agreements have recently been signed with the Governments of Australia and Taiwan to promote scientific cooperation. The National Science Foundation is the Executive Agency for both agreements. All interested agencies should get in touch with NSF for information on participation.

Attached for your information is the agreement signed with Australia. As soon as we receive copies of the agreement signed with Taiwan they will be made available.

Attachment: Bilateral Scientific Agreement with Australia.

ATTACHMENT

AUSTRALIA—SCIENTIFIC AND TECHNICAL COOPERATION

Agreement signed at Canberra October 16, 1968; Entered into force October 16, 1968.

AGREEMENT RELATING TO SCIENTIFIC AND TECHNICAL COOPERATION BETWEEN THE GOVERNMENT OF THE UNITED STATES OF AMERICA AND THE GOVERNMENT OF THE COMMONWEALTH OF AUSTRALIA

The Government of the United States of America and the Government of the Commonwealth of Australia,

RECOGNIZING that scientific and technical cooperation will advance the state of science and strengthen the bonds of friendship to their mutual benefit,

DESIRING to promote in areas of common interest the closest collaboration between the civil scientific agencies or institutions of both countries,

HAVE AGREED as follows:

ARTICLE 1

The principal object of this cooperation is to provide additional opportunities to exchange ideas, information, skills and techniques, to collaborate on problems of mutual interest, to work together in unique environments and to utilize special facilities.

ARTICLE 2

To the extent that the two Governments agree, this cooperation may include the exchange of scientists and technical experts, the pursuit of joint research activities, the convocation of joint meetings, and any

other joint activity which may further such cooperation. The scientists and experts involved may be those in Government agencies or in academic or other institutions of either country.

ARTICLE 3

In appropriate cases scientists, experts, agencies or institutions of third countries may be encouraged to participate in particular cooperative projects or programs.

ARTICLE 4

Each Government shall bear, in accordance with its appropriate financial and budgetary processes and subject to the availability of funds, the costs of discharging its responsibilities under particular projects or programs; in specific cases the costs shall be borne as agreed between the respective Governments.

ARTICLE 5

Each Government shall facilitate entry to and exit from its territory of personnel and equipment of the other country, engaged on or used in projects and programs under this Agreement.

ARTICLE 6

Scientific information derived from a cooperative activity under this Agreement will be made available to the world's scientific community through customary channels and in accordance with the normal procedures of each Government for the particular activity.

ARTICLE 7

The two Governments will jointly review the progress of cooperation under this Agreement from time to time.

ARTICLE 8

The two Governments may conclude implementing arrangements through appropriate channels with respect to particular projects or programs in the scientific and technical field. An implementing arrangement may specify the area of cooperation, the agencies involved, the procedures to be followed, including financial arrangements, and other appropriate matters. The terms of this Agreement shall apply to the implementing arrangement unless the parties otherwise agree.

ARTICLE 9

Upon the request of either Government the two Governments shall consult with regard to any amendment of, or other matter relating to this Agreement or any implementing arrangement made under this Agreement.

ARTICLE 10

Nothing in this Agreement shall be construed to prejudice other arrangements for scientific and technical cooperation between the two Governments.

ARTICLE 11

This Agreement shall enter into force upon signature and shall remain in force for five years unless extended by agreement between the two Governments. The termination of this Agreement shall not affect the validity or duration of any implementing arrangement made under it.

IN WITNESS WHEREOF the undersigned, being duly authorised by their respective Governments, have signed this Agreement.

DONE at Canberra, this sixteenth day of October, One thousand nine hundred and sixty-eight in duplicate in the English language.

WILLIAM H. CROOK

MALCOLM FRASER

DONALD F. HORNIG

FOR THE GOVERNMENT OF THE
UNITED STATES OF AMERICA

FOR THE GOVERNMENT OF
THE COMMONWEALTH OF
AUSTRALIA

(14)

NOVEMBER 13, 1968—PAYMENT OF PUBLICATION COSTS FROM
FEDERAL RESEARCH GRANT AND CONTRACT FUNDS

Source: U.S. Federal Council for Science and Technology. Memorandum for Members, Federal Council for Science and Technology, subject: Payment of publication costs from Federal research grant and contract funds, November 13, 1968, from Donald F. Hornig, Chairman. 1 p.

As a result of financial problems some research performers have attempted to economize by refusing to pay page charges to scientific journals, and although this is only a small cloud on the horizon now, a general extension of the practice would lead to severe financial difficulties for the journals and for the professional societies which sponsor them. Of course, an available remedy is to replace voluntary by mandatory page charges, but this would make journals unavailable to those scientists who have no financial resources.

This matter was discussed by the Federal Council for Science and Technology and the following position is that of the Council.

The publication of research results is an essential part of the research process. This has been recognized in part through authorization to pay publication costs from Federal research grant and contract funds. It is the intention of the Federal Government when making research grants or contracts that costs of such publication (including page charges) should continue to be borne from the grant or contract, if other sources are not available.

I expect that each Federal agency will take steps to inform the staff and contract officers that this represents the position of their agency. Whenever in a position to do so, they should encourage performers to pay the page charges.

DONALD F. HORNIG,
Chairman.

FEBRUARY 21, 1969—POLICY ON EXPANDED USE OF FEDERAL
RESEARCH FACILITIES BY UNIVERSITY INVESTIGATORS

Source: U.S. Federal Council for Science and Technology. Memorandum for members, Federal Council for Science and Technology, February 24, 1969, from Lee A. DuBridge, Chairman, subject: Expanded use of Federal research facilities by university investigators. 1 p. Attachments: Policy on expanded use of Federal research facilities by university investigators, February 21, 1969. 2 p. and White House press release of February 21, 1969 in which President Nixon approved the policy.

Subject: Expanded Use of Federal Research Facilities by University Investigators.

The President has approved the attached policy, which is based upon studies by the Committee on Federal Laboratories of the Federal Council for Science and Technology. Departments and agencies should incorporate the substance of the policy in their instructions to laboratory directors.

The Committee on Federal Laboratories of the Federal Council for Science and Technology will periodically review progress towards the goals set by this policy.

LEE A. DUBRIDGE,
Chairman.

Attachments.

ATTACHMENT 1

FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

POLICY ON EXPANDED USE OF FEDERAL RESEARCH FACILITIES BY
UNIVERSITY INVESTIGATORS

Unique, unusual, and expensive-to-duplicate facilities at Federal laboratories and federally-supported research centers should be made available to the national scientific community to the maximum extent practical without serious detriment to laboratory missions, especially to qualified academic scientists and engineers. Criteria for such use should be the scientific merit of the proposed experiment, its relation to the agency research mission, and its contribution to national research and research training.

When such facilities are used by academic scientists and engineers, the costs incurred by the laboratory or center for the operation of its unique or unusual research facilities should be funded by the agency responsible for the operation of that facility, except for any significant incremental costs incurred in support of research not directly related to the agency's mission. The research costs incurred at the experimenter's home institution and significant costs for specialized equipment fabricated at the center primarily for use by the particular experimenter should normally be borne by the granting agency, the home institution, and/or other sponsoring organization. However, when the research is sufficiently related or useful to the host agency's responsibility, these costs may be borne by the agency responsible for operation of the center.

IMPLEMENTING INSTRUCTIONS

1. Departments and agencies should delegate authority for negotiations and decisions as to the use of Federal facilities by outside groups to local laboratory directors to the maximum extent possible, with such actions remaining as flexible and informal as responsible practice would indicate. Directors should be encouraged to make appropriate use of advisory groups in formulating their decisions.

2. When programs for non-government use of Federal facilities are expanded, department and agency officials should be prepared to assist laboratory directors obtain correspondingly increased staff and budget allocations.

3. Federal laboratory officials should seek agreements, executed by non-government users, absolving the Federal agency of liability in case of personal injury, death, and failure or damage to experiments or equipment.

ATTACHMENT 2

FEBRUARY 21, 1969.

THE WHITE HOUSE

The President today approved a policy directing the Federal agencies to adopt procedures to make the very valuable equipment now in use in Federal laboratories more readily available to qualified university scientists who need and can make good use of it. He directed Dr. Lee A. DuBridge, his Science Adviser, to monitor the execution of this policy by the Federal agencies.

The President said: "The equipment of many Federal laboratories is superb and often unique. This investment should be viewed as a national resource and not one for the exclusive use of the laboratory staff members. While many scientists and engineers from universities now frequently use Federal research facilities, an even closer and more extensive cooperative relation will be productive. I am therefore approving a policy designed to bring this about. Dr. DuBridge will be able to implement the policy with the help of the Federal Council for Science and Technology, which has recommended its adoption."

(16)

JULY 14, 1969—GUIDELINES ON EXCHANGE OF UNCLASSIFIED SCIENTIFIC AND TECHNICAL INFORMATION WITH COUNTRIES WITH WHICH WE DO NOT HAVE DIPLOMATIC RELATIONS

Source: U.S. Secretary of State. Guidelines on exchange of unclassified scientific and technical information with countries with which we do not have diplomatic relations. July 14, 1969. Attachment: Definition of scientific and technical information. 2 p. and 2 p.

NOTE: Memorandum from Eric B. Ward, Executive Secretary, Federal Council for Science and Technology to Herman Pollack of Aug. 11, 1969, noted that the discussion of these guidelines would be an agenda item for the Federal Council meeting, tentatively set for September 10, 1969.

Unclassified scientific and technical information (definition attached) not subject to Munitions and Export Controls of the Departments of State and Commerce or restricted by the Atomic Energy Act is now being exchanged extensively by various United States Government agencies with many nations in consonance with established policy. An articulation of this policy was made by the Federal Council for Science and Technology in March 1968 when it declared that "the United States Government seeks the widest possible dissemination of knowledge and, in particular, the open exchange of scientific and technical information."

There is considerable variation among the Government agencies in the practices they follow with regard to exchanges of information with people and institutions in countries with which we do not have diplomatic relations. The purpose of this memorandum is to provide permissive guidelines regarding such exchanges.

It is considered to be to the over-all benefit of the United States to permit the exchange of unclassified information with any country unless there are specific, overriding considerations of foreign or domestic policy. Thus, President Eisenhower said in March 1960: "I have come to put it almost as a truism in my own thinking that only through the exchange of information among peoples, resulting in better understanding of the basic issues in the world, are we going to have peace." In January 1964, President Johnson stated that "... common sense dictates that all nations lend their learning to all other nations. This is a loan in which the science of all nations is the beneficiary and the good of mankind is advanced." In the same spirit President Nixon said in his Inaugural Address: "We seek an open world—open to ideas, open to the exchange of goods and people, a world in which no people great or small will live in angry isolation."

Accordingly, the following guidelines are provided to United States Government agencies.

1. Unclassified scientific and technical information not subject to the Munitions and Export Controls of the Departments of State and Commerce or restricted by the Atomic Energy Act may be exchanged with persons and scientific or technical institutions of any country, including those with which we do not have diplomatic relations. The decision whether or not to exchange such information will be the responsibility of the United States agency involved. While absolute reciprocity is not necessarily required, this policy is based on an implicit presumption that a meaningful "exchange" of information will occur. It is, of course, not contemplated that United States technological information of value from a security viewpoint or information related to military applications will be transmitted.

2. If a large-scale exchange is contemplated, or if the agency believes exceptional circumstances require special consideration, the case should be referred to the appropriate office of the Department of State for foreign policy guidance.

WILLIAM P. ROGERS.

Attachment.

ATTACHMENT

DEFINITION: SCIENTIFIC AND TECHNICAL INFORMATION

Scientific and technical information as used in this paper is defined as follows:

Scientific and technical information is defined as unclassified non-proprietary information of a scientific or technical nature generally available to the public covering natural, social and information sciences, which is generated by U.S. Federal Government facilities, contractors, or grantees, and which is releasable to foreign countries under the terms of the Munitions and Export Control Acts and regulations. Scientific and technical information specifically includes reports, serials, machine readable information, and machine software used in conjunction with Federally-owned or operated machine systems or their components.

Unclassified scientific and technical information not restricted by Export Controls of the Department of Commerce which may be disclosed to anyone without further reference to or authorization from the Department of Commerce is defined as follows:

(a) *Data generally available.*—Data that have been made generally available to the public in any form, including: (1) data released orally or visually at open conferences, lectures, trade shows, or other media open to the public; and (2) publications that may be purchased without restrictions at a nominal cost or obtained without cost or are readily available at libraries open to the public. The term “nominal cost” as used above is intended to reflect realistically only the cost of preparing and distributing the publication and not the intrinsic value of the technical data. If the cost is such as to prevent the technical data from being generally available to the public, general license: technical data available to all destinations (GTDA) would not be applicable.

(b) *Scientific or educational data.*—(1) Information not directly and significantly related to design, production, or utilization in industrial processes, including such dissemination by correspondence, attendance at, or participation in, meetings; or

(2) Instruction in academic institutions and academic laboratories, excluding information that involves research under contract related directly and significantly to design, production, or utilization in industrial processes.

(17)

JULY 1, 1970—GUIDELINES FOR SUBMITTING PROPOSALS UNDER INTERGOVERNMENTAL SCIENCE PROGRAMS

Source: U.S. National Science Foundation. Guidelines for submitting proposals under intergovernmental science programs. July 1, 1970. 2 p.

The National Science Foundation awards grants to enable State and local levels of government to develop improved programs and institutions for applying science and technology to governmental problems, and for implementing recommendations or utilizing information resulting from NSF programs.

Objectives of Intergovernmental Science Programs are:

(1) To advance the understanding of public issues and problems having scientific and technological content at the State and local levels of government, and to assess needs and opportunities for more effective application of science and technology;

(2) To demonstrate innovative science and technology planning and decisionmaking processes related to State, local, and regional problems;

(3) To stimulate selected State and local governments' experimentation, on a pilot basis, with science and technology systems in the context of their own needs and resources;

(4) To encourage adoption of new systems which show promise for enhancing State and local ability to incorporate science and technology into public programs;

(5) To improve communication between persons and groups concerned with science and technology at the Federal, State, and local levels of government.

The proposal activity must involve a problem of general interest to State and local governments. Preference will be given to innovative approaches looking toward the development of models for governmental use of science and technology. Activities supported may include research projects, manpower and education programs (involving State and local government officials), technology assessment and forecasting studies, and planning studies to help develop innovative policies and programs for State and local governments. Institutional support will be provided to assist in establishment of centers for governmental science policy planning. Conferences and seminar projects at the State, regional and national levels, and projects to collect and analyze data on State and local scientific and technical resources will also be supported.

ELIGIBILITY

Proposals may be submitted by units of State and local governments and their regional organizations, legislatures, law schools, State academies of science, colleges and universities that grant at least a baccalaureate-level degree in science, and nonprofit institutions. Joint proposals from academic institutions in association with a unit of government will be given preference; however, awards will be made under other organizational arrangements. There is no requirement for matching funds, but normally applicants are required to share in the cost of any proposed activity. This may be accomplished by a contribution to any cost element in the project, direct or indirect.

Proposals may be submitted to other Federal agencies for partial support and to NSF for those activities that fall outside the program scope of other Federal agencies. Activities completely within the programs of other Federal agencies will not be funded by NSF. Proposals from academic institutions that are not submitted in association with a unit of government should ordinarily be submitted under other NSF programs (e.g., see particularly the following programs described in the *NSF Guide to Programs*: Interdisciplinary Research Relevant to the Problems of Our Society; University Science Planning and Policy Program; Science Development Program.)

DEADLINES

Proposals may be submitted at any time; processing of a proposal requires approximately six months. Informal inquiry to the Foundation may be made to determine whether or not a potential project would qualify for support under NSF Intergovernmental Science Programs.

ADDITIONAL INFORMATION

Supplementary guidelines for preparation of proposals are available in the NSF pamphlet *Grants for Scientific Research*.

Communications may be addressed to: Dr. M. Frank Hersman, Head, Office of Intergovernmental Science Programs, National Science Foundation, Washington, D.C. 20550.

(18)

AUGUST 23, 1971—PRESIDENTIAL MEMORANDUM AND STATEMENT OF GOVERNMENT PATENT POLICY

Source: Federal Register, v. 36, no. 166, August 26, 1971, pp. 16887-16892.

MEMORANDUM FOR HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

THE WHITE HOUSE,
Washington, August 23, 1971.

On October 10, 1963, President Kennedy forwarded to the Heads of Executive Departments and Agencies a Memorandum and Statement of Government Patent Policy for their guidance in determining the disposition of rights to inventions made under Government-sponsored grants and contracts. On the basis of the knowledge and experience then available, this Statement first established Government-wide objectives and criteria, within existing legislative constraints, for the allocation of rights to inventions between the Government and its contractors.

It was recognized that actual experience under the Policy could indicate the need for revision or modification. Accordingly, a Patent Advisory Panel was established under the Federal Council for Science and Technology for the purpose of assisting the agencies in implementing the Policy, acquiring data on the agencies' operations under the Policy, and making recommendations regarding the utilization of Government-owned patents. In December 1965, the Federal Council established the Committee on Government Patent Policy to assess how this Policy was working in practice, and to acquire and analyze additional information that could contribute to the reaffirmation or modification of the Policy.

The efforts of both the Committee and the Panel have provided increased knowledge of the effects of Government patent policy on the public interest. More specifically, the studies and experience over the past 7 years have indicated that:

(a) A single presumption of ownership of patent rights to Government-sponsored inventions either in the Government or in its contractors is not a satisfactory basis for Government patent policy, and that a flexible, Government-wide policy best serves the public interest;

(b) The commercial utilization of Government-sponsored inventions, the participation of industry in Government research and development programs, and commercial competition can be influenced by the following factors: the mission of the contracting agency; the purpose and nature of the contract; the commercial applicability and market potential of the invention; the extent to which the invention is developed by the contracting agency; the promotional activities of the contracting agency; the commercial orientation of the contractor and the extent of his privately financed research in the related technology; and the size, nature and research orientation of the pertinent industry;

(c) In general, the above factors are reflected in the basic principles of the 1963 Presidential Policy Statement.

Based on the results of the studies and experience gained under the 1963 Policy Statement certain improvements in the Policy have been recommended which would provide (1) agency heads with additional authority to permit contractors to obtain greater rights to inventions where necessary to achieve utilization or where equitable circumstances would justify such allocation of rights, (2) additional guidance to the agencies in promoting the utilization of Government-sponsored inventions, (3) clarification of the rights of States and municipal governments in inventions in which the Federal Government acquires a license, and (4) a more definitive data base for evaluating the administration and effectiveness of the Policy and the feasibility and desirability of further refinement or modification of the Policy.

I have approved the above recommendations and have attached a revised Statement of Government Patent Policy for your guidance. As with the 1963 Policy Statement, the Federal Council shall make a continuing effort to record, monitor and evaluate the effects of this Policy Statement. A Committee on Government Patent Policy, operating under the aegis of the Federal Council for Science and Technology, shall assist the Federal Council in these matters.

This memorandum and statement of policy shall be published in the FEDERAL REGISTER.

RICHARD NIXON.

STATEMENT OF GOVERNMENT PATENT POLICY

BASIC CONSIDERATIONS

A. The Government expends large sums for the conduct of research and development which results in a considerable number of inventions and discoveries.

B. The inventions in scientific and technological fields resulting from work performed under Government contracts constitute a valuable national resource.

C. The use and practice of these inventions and discoveries should stimulate inventors, meet the needs of the Government, recognize the equities of the contractor, and serve the public interest.

D. The public interest in a dynamic and efficient economy requires that efforts be made to encourage the expeditious development and civilian use of these inventions. Both the need for incentives to draw forth private initiatives to this end, and the need to promote healthy competition in industry must be weighed in the disposition of patent rights under Government contracts. Where exclusive rights are

acquired by the contractor, he remains subject to the provisions of the antitrust laws.

E. The public interest is also served by sharing of benefits of Government-financed research and development with foreign countries to a degree consistent with our international programs and with the objectives of U.S. foreign policy.

F. There is growing importance attaching to the acquisition of foreign patent rights in furtherance of the interests of U.S. industry and the Government.

G. The prudent administration of Government research and development calls for a Government-wide policy on the disposition of inventions made under Government contracts reflecting common principles and objectives, to the extent consistent with the missions of the respective agencies. The policy must recognize the need for flexibility to accommodate special situations.

POLICY

SECTION 1. The following basic policy is established for all Government agencies with respect to inventions or discoveries made in the course of or under any contract of any Government agency, subject to specific statutes governing the disposition of patent rights of certain Government agencies.

(a) Where

(1) a principal purpose of the contract is to create, develop or improve products, processes, or methods which are intended for commercial use (or which are otherwise intended to be made available for use) by the general public at home or abroad, or which will be required for such use by governmental regulations; or

(2) a principal purpose of the contract is for exploration into fields which directly concern the public health, public safety, or public welfare; or

(3) the contract is in a field of science or technology in which there has been little significant experience outside of work funded by the Government, or where the Government has been the principal developer of the field, and the acquisition of exclusive rights at the time of contracting might confer on the contractor a preferred or dominant position; or

(4) the services of the contractor are

(i) for the operation of a Government-owned research or production facility; or

(ii) for coordinating and directing the work of others,
the Government shall normally acquire or reserve the right to acquire the principal or exclusive rights throughout the world in and to any inventions made in the course of or under the contract.

In exceptional circumstances the contractor may acquire greater rights than a nonexclusive license at the time of contracting where the head of the department or agency certifies that such action will best serve the public interest. Greater rights may also be acquired by the contractor after the invention has been identified where the head of the department or agency determines that the acquisition of such greater rights is consistent with the intent of this Section 1(a) and is either a necessary incentive to call forth private risk capital and expense to bring the invention to the point of practical application or that the

Government's contribution to the invention is small compared to that of the contractor. Where an identified invention made in the course of or under the contract is not a primary object of the contract, greater rights may also be acquired by the contractor under the criteria of Section 1(c).

(b) In other situations, where the purpose of the contract is to build upon existing knowledge or technology, to develop information, products, processes, or methods for use by the Government, and the work called for by the contract is in a field of technology in which the contractor has acquired technical competence (demonstrated by factors such as know-how, experience, and patent position) directly related to an area in which the contractor has an established non-governmental commercial position, the contractor shall normally acquire the principal or exclusive rights throughout the world in and to any resulting inventions.

(c) Where the commercial interests of the contractor are not sufficiently established to be covered by the criteria specified in Section 1(b) above, the determination of rights shall be made by the agency after the invention has been identified, in a manner deemed most likely to serve the public interest as expressed in this policy statement, taking particularly into account the intentions of the contractor to bring the invention to the point of commercial application and the guidelines of Section 1(a) hereof, provided that the agency may prescribe by regulation special situations where the public interest in the availability of the inventions would best be served by permitting the contractor to acquire at the time of contracting greater rights than a nonexclusive license.

(d) In the situations specified in Sections 1(b) and 1(c), when two or more potential contractors are judged to have presented proposals of equivalent merit, willingness to grant the Government principal or exclusive rights in resulting inventions will be an additional factor in the evaluation of the proposals.

(e) Where the principal or exclusive rights in an invention remain in the contractor, he should agree to provide written reports at reasonable intervals, when requested by the Government, on the commercial use that is being made or is intended to be made of inventions made under Government contracts.

(f) Where the principal or exclusive rights in an invention remain in the contractor, unless the contractor, his licensee, or his assignee has taken effective steps within three years after a patent issues on the invention to bring the invention to the point of practical application or has made the invention available for licensing royalty-free or on terms that are reasonable in the circumstances, or can show cause why he should retain the principal or exclusive rights for a further period of time, the Government shall have the right to require the granting of a nonexclusive or exclusive license to a responsible applicant(s) on terms that are reasonable under the circumstances.

(g) Where the principal or exclusive rights to an invention are acquired by the contractor, the Government shall have the right to require the granting of a nonexclusive or exclusive license to a responsible applicant(s) on terms that are reasonable in the circumstances (i) to the extent that the invention is required for public use by governmental regulations, or (ii) as may be necessary to fulfill health or safety needs, or (iii) for other public purposes stipulated in the contract.

(h) Whenever the principal or exclusive rights in an invention remain in the contractor, the Government shall normally acquire, in addition to the rights set forth in Sections 1(e), 1(f), and 1(g),

(1) at least a nonexclusive, nontransferable, paid-up license to make, use, and sell the invention throughout the world by or on behalf of the Government of the United States (including any Government agency) and States and domestic municipal governments, unless the agency head determines that it would not be in the public interest to acquire the license for the States and domestic municipal governments; and

(2) the right to sublicense any foreign government pursuant to any existing or future treaty or agreement if the agency head determines it would be in the national interest to acquire this right; and

(3) the principal or exclusive rights to the invention in any country in which the contractor does not elect to secure a patent.

(i) Whenever the principal or exclusive rights in an invention are acquired by the Government, there may be reserved to the contractor a revocable or irrevocable nonexclusive royalty-free license for the practice of the invention throughout the world; an agency may reserve the right to revoke such license so that it might grant an exclusive license when it determines that some degree of exclusivity may be necessary to encourage further development and commercialization of the invention. Where the Government has a right to acquire the principal or exclusive rights to an invention and does not elect to secure a patent in a foreign country, the Government may permit the contractor to acquire such rights in any foreign country in which he elects to secure a patent, subject to the Government's rights set forth in Section 1(h).

SEC. 2. Under regulations prescribed by the Administrator of General Services, Government-owned patents shall be made available and the technological advances covered thereby brought into being in the shortest time possible through dedication or licensing, either exclusive or non-exclusive, and shall be listed in official Government publications or otherwise.

SEC. 3. The Federal Council for Science and Technology in consultation with the Department of Justice shall prepare at least annually a report concerning the effectiveness of this policy, including recommendations for revision or modification as necessary in light of the practices and determinations of the agencies in the disposition of patent rights under their contracts. The Federal Council for Science and Technology shall continue to

(a) develop by mutual consultation and coordination with the agencies common guidelines for the implementation of this policy, consistent with existing statutes, and to provide overall guidance as to disposition of inventions and patents in which the Government has any right or interest; and

(b) acquire data from the Government agencies on the disposition of patent rights to inventions resulting from federally financed research and development and on the use and practice of such inventions to serve as bases for policy review and development; and

(c) make recommendations for advancing the use and exploitation of Government-owned domestic and foreign patents.

Each agency shall record the basis for its actions with respect to inventions and appropriate contracts under this statement.

SEC. 4. Definitions: As used in this policy statement, the stated terms in singular and plural are defined as follows for the purposes hereof:

(a) *Government agency*—includes any executive department, independent commission, board, office, agency, administration, authority, Government corporation, or other Government establishment of the executive branch of the Government of the United States of America.

(b) *States*—means the States of the United States, the District of Columbia, Puerto Rico, the Virgin Islands, American Samoa, Guam and the Trust Territory of the Pacific Islands.

(c) *Invention, or Invention or discovery*—includes any art, machine, manufacture, design, or composition of matter, or any new and useful improvement thereof, or any variety of plant, which is or may be patentable under the Patent Laws of the United States of America or any foreign country.

(d) *Contractor*—means any individual, partnership, public or private corporation, association, institution, or other entity which is a party to the contract.

(e) *Contract*—means any actual or proposed contract, agreement, grant, or other arrangement, or subcontract entered into with or for the benefit of the Government where a purpose of the contract is the conduct of experimental, developmental, or research work.

(f) *Made*—when used in relation to any invention or discovery means the conception or first actual reduction to practice of such invention in the course of or under the contract.

(g) *To the point of practical application*—means to manufacture in the case of a composition or product, to practice in the case of a process, or to operate in the case of a machine and under such conditions as to establish that the invention is being worked and that its benefits are reasonably accessible to the public.

(19)

NOVEMBER 8, 1974—NOTICE OF POLICY ON PAGE CHARGES

Source: Federal Register, v. 39, no. 224, November 19, 1974, p. 40611.

FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

NOTICE OF POLICY ON PAGE CHARGES

The following is a statement of the revised policy on payment of page charges which has recently been approved by the Federal Council for Science and Technology:

The publication of research results is an essential part of the research process. This has been recognized in part through authorization to pay publication costs from Federal research grant and contract funds. It is the intention of the Federal Government when making research grants or contracts that costs of such publications, including page charges, should continue to be borne from the grant or contract, if other sources are not available.

Scientific policy representatives of Federal agencies that constitute the Federal Council for Science and Technology have established the following criteria for honoring page charge bills submitted by journal publishers.

(1) The research papers report work supported by the Government.

(2) Mandatory or voluntary page charge policies are acceptable, provided that the page charge policy of the publication is administered impartially for Government and non-Government sponsored research reports.

(3) The journals involved are not operated for profit. The Federal Council for Science and Technology was established by Executive Order 10807, in 1959, and is composed of representatives from the Departments of Agriculture, Commerce, Defense, HEW, HUD, Interior, State, and Transportation, National Aeronautics and Space Administration, Atomic Energy Commission, and the National Science Foundation. Its purpose is to provide more effective planning and administration of Federal scientific and technological programs.

November 8, 1974.

RUSSELL C. DREW,
Acting Executive Secretary.

(20)

JUNE 29, 1976—DEVELOPMENT OF GENERAL GUIDELINES FOR R&D
RECOUPMENT BY THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Source: U.S. Federal Council for Science and Technology. Memorandum for all Cabinet officials and heads of certain other agencies from H. Guyford Stever, Chairman, dated June 29, 1976, Subject: Progress report on development of general guidelines for R&D recoupment by Federal Council for Science and Technology. 2 p. Attachment: Recoupment guidelines. 8 p.

Memorandum for: the Secretary of State, the Secretary of the Treasury, the Secretary of Defense, the Attorney General, the Secretary of the Interior, the Secretary of Agriculture, the Secretary of Commerce, the Secretary of Labor, the Secretary of Health, Education, and Welfare, the Secretary of Housing and Urban Development, the Secretary of Transportation; Director, Office of Management and Budget; Chairman, Council of Economic Advisers; Administrator, General Services Administration; Administrator, National Aeronautics and Space Administration; Chairman, Nuclear Regulatory Commission; Administrator, Environmental Protection Agency; Administrator of Veterans Affairs; Executive Director, Council on International Economic Policy; Director, Office of Federal Procurement Policy.

Subject: Progress Report on Development of General Guidelines for R&D Recoupment by Federal Council for Science and Technology.

You will recall, as outlined in my memorandum of May 27, 1975, a year ago, that the Federal Council for Science and Technology agreed to undertake to develop general guidelines which would derive from consideration of the impact of R&D recoupment provisions (CIEP Decision Memorandum 23 of August 2, 1974) on the basic R&D goals and strategies of agencies involved.

To carry out this assignment John V. Granger, then Executive Secretary of the Federal Council, organized an ad hoc Working Group. Specifically I asked that this group focus on the effect of recoupment policies on the fundamental missions of the agencies, the broader aspect of the relationship between the agencies and their R&D contractors, and the importance of commercial exploitation of agency-sponsored R&D to the public interest.

A set of guidelines and criteria were drafted by this Working Group and circulated to its members for comment in late January of this year. A number of substantive suggestions were received which have now been taken into account in the attached revised document, *Recoupment Guidelines*.

You may also find useful the attached brief summary of responses received and points of clarification contained in a memorandum to W. C. Bartley, Executive Secretary of the FCST, dated May 21, 1976, prepared by three National Science Foundation staff members who assisted in assembling these guidelines.

In fulfilling its role as outlined in the memorandum of April 15, 1975 from Mr. John A. Hill, (then) Acting Associate Director for Natural Resources, Energy and Science, of the Office of Management and Budget, the Council I hope has been able to contribute to developing criteria and guidelines that can promote greater uniformity in the application of the Federal policy on R&D Recoupment.

H. GUYFORD STEVER,
Chairman.

Attachments. [Recoupment Guidelines only]

RECOUPMENT GUIDELINES

Council on International Economic Policy Decision Memorandum No. 23 (see Appendix) established a Government-wide policy for recoupment of Federal R&D investments on Government-owned and financed technologies and products when proposed for sale to non-U.S. Government buyers. The Federal Council for Science and Technology was asked to assist agencies in development of criteria and guidelines that would promote a reasonable degree of uniformity in the application of a recoupment policy (see Appendix).

While recoupment, and the many issues surrounding a recoupment policy, have been discussed over a number of years, the definitions of issues and words used in these discussions have not always been clear. As a result, it is difficult to interpret the Decision Memorandum and the intentions of its framers. The guidelines below, however, are based on what is inferred to be the intention of the Decision Memorandum, based on a review of material prepared prior to and subsequent to its issuance.

"Recoupment," in most cases, refers to financial repayment to the Government of part or all (or more than) the expenditures it makes to private organizations for R&D when such expenditures lead to goods or services that are sold, at a profit, to buyers other than the Federal Government. This includes sales to individuals or organizations here or abroad, and to non-Federal U.S. or any foreign govern-

ments. The repayment would be made by the firm (or other organization) that was selling the good or service. We do not consider here products or services sold or provided *directly* by the Federal Government, assuming following OMB Circular No. A-25 on User Charges, that reasonable charges will be made "to each identifiable recipient for a measurable unit or amount of Government service or property from which he derives a special benefit." However, recoupment could apply to sales of technology owned by the Government, such as in patent licensing.

The attached table of general guidelines has been prepared in response to the request made to the Federal Council for Science and Technology for assistance in development of criteria and guidelines on recoupment. The result of this memorandum elaborates on the guidelines listed on the table, and provides a few general procedural guidelines. In addition, this memorandum (and accompanying materials) attempts to provide more precise definitions of issues and terms.

The following guidelines cover both product sales (physical objects) and technology sales (patents, copyrights, know-how, etc.).

RECOUPMENT GUIDELINES

Circumstances in which recoupment should be considered	Exceptions, or circumstances in which recoupment may not be appropriate
Distribution of benefits: (1) When benefits are largely to private concerns and more general benefits to public at large are less than the R. & D. costs.	(1) When benefits to public at large stemming from the R. & D. are greater than the costs of the R. & D., and these public benefits were a major reason for undertaking the R. & D.
Source of funds: (2) Federal Government contributed a substantial proportion of the R. & D. for a product or technology and absorbed most of the risk.	(2) When industry has contributed a substantial proportion of the R. & D. and absorbed most of the risk, or when public and private contributions and risk-taking cannot be separated or are very complex.
Sector of use: (3) When the technologies are developed primarily for the use or benefit of the private sector.	(3) When, though technology was developed primarily for use by the private sector, a subsidy to the industry or to users of the technology was the initial intention of R. & D.
Level of funds: (4) When amount spent by Federal Government on R. & D. is above some minimum amount, to be set by the agency, so that the administrative costs of recoupment are not excessive in relation to the benefits.	(4) When amount spent by Federal Government is below a minimum amount, indicating that the administrative costs of recoupment are likely to be greater than the amount recouped.
Government rights: (5) Where Federal Government holds rights in the information or technology used or sold, e.g., through contractual provisions.	(5) Where Federal Government has no contractual or other rights in the particular hardware or technology.
Type of R. & D.: (6) Where R. & D. is more toward the development and use end of the R. & D. spectrum.	(6) Basic research.
Legal conflicts (7) Where recoupment would not legally conflict with existing legislation.	(7) Where recoupment would conflict with existing legislation, such as responsibilities for exchange or dissemination of information.
Policy conflicts: (8) Where recoupment would not conflict with important and overriding concerns of national security, foreign policy, or other public considerations.	(8) Where recoupment would conflict with important and overriding concerns of national security, foreign policy, or other public considerations.
Buyer: (9) Any sale other than to the Federal Government, whether foreign or domestic.	(9) No exceptions based on a foreign/domestic distinction alone.
Equity among firms: (10) Where R. & D. is within control of United States as opposed to being subject to an agreement with other countries.	(10) Where support of R. & D. by joint agreement with other countries might result in recoupment's discriminating against U.S. firms.

(1) *Distribution of Benefits.* When benefits are largely to private concerns and more general benefits to the public are less than the R&D costs, recoupment should be considered.

One rationale for government support of R&D stems from the "underinvestment" concept—i.e., because of imperfections in the market for R&D, a divergence exists between what the private sector is willing to spend on R&D and a greater amount (or in some cases a lesser amount) that is socially desirable. To the extent government supports R&D which may have commercial application because it sees the social benefits as exceeding the social costs (including any costs the government might incur), the activity is justified on economic efficiency grounds and direct financial recoupment of the costs involved is not necessary for the public to benefit. The outcome of government R&D expenditures is in the form of public or social benefits which were the reason for support of the R&D in the first place. Recoupment may, thus, not be appropriate when (a) benefits to the general public stemming from the R&D are greater than the costs of the R&D and (b) these expected public benefits were a major reason for undertaking the R&D. Where such public or social benefits do not exceed the costs of the R&D, the project may not be suitable for government support at all, or if supported, would be a candidate for recoupment. For further discussion of this issue, see the paper by Windus and Schiffel in the Appendix.

(2) *Source of Funds.* Recoupment should be considered when the Federal Government has contributed a substantial proportion of the R&D for a product or technology and absorbed most of the risk.

This guideline addresses the relative risk and contributions of the public and private sectors in developing a product or technology. Information may be sketchy or lacking on investments made by the private sector in R&D, and such information gaps may make it difficult to sort out what the respective cost and knowledge contributions of industry and government have been or will be. When public and private contributions and risk-taking cannot be separated or are very complex, recoupment may not be appropriate. It may also not be appropriate to recoup when industry has contributed a substantial portion of the R&D or the technology base for the particular R&D contract and absorbed most of the risk.

(3) *Sector of Use.* Recoupment should be considered when the technology is developed primarily for the use or benefit of the private sector.

Although technologies developed primarily for the private sector should be considered for recoupment, some technologies (such as vaccines) may provide great benefits to the public at large and thus be considered for exemption under guideline 1. It may be, however, that recoupment should be considered whenever the private sector is the main sector of use, irrespective of public or social benefits, in order to obtain a return to the government on its R&D investment. If the initial reason or intention for funding the R&D was to provide a subsidy to the industry involved, it may be counterproductive to require recoupment, and an exemption should be considered.

(4) *Level of Funds.* Recoupment should be considered when the amount spent by the Federal Government on R&D is above some minimum amount, to be set by the agency.

The essential point of this guideline is that the administrative difficulties and costs of recoupment must be weighed against the expected benefits of recoupment. R&D expenditures below a minimum amount may result in administrative costs of recoupment greater than the amount likely to be recovered. Because of differing bidding and contracting procedures, this level may vary from agency to agency, and possibly over time. Exceptions to recoupment should be automatic below this minimum amount.

(5) *Government Rights*. Recoupment should be considered when the Federal Government holds rights in the information or technology used or sold, e.g. through contractual provisions.

This guideline points out one of the administrative difficulties of recoupment. If the R&D contract does not specify repayment, there may be no legal basis for the government to recoup for use of the knowledge gained from R&D. Because of this, specification of recoupment provisions should be made at the time of bidding and contracting and should not be attempted on an *ex post facto* basis. It is thus the responsibility of each agency to consider likely candidates for recoupment well in advance of the emergence of a market for the final product or technology. Recoupment is not dependent on patent title policy, i.e. the government may retain the right to recoup irrespective of whether patent title is held by the Government or by a private firm. A difficulty may arise when R&D does not result in a patent, in which case the government could not recoup from a firm which was not a party to the R&D contract but might use the results of the R&D. Exceptions might be considered in situations such as this if inequities result among firms.

(6) *Type of R&D*. Recoupment should be considered where the R&D is more toward the development and applied end of the R&D spectrum, i.e. nearer to incorporation in a product.

The feasibility of tracing the ultimate use and value of research is lower where basic research is involved and becomes higher as one moves toward development of a technology. As a result, basic research in general should be excluded from recoupment while development work should usually be considered for recoupment. Applied research should be included when administratively feasible and not too costly to trace.

(7) *Legal Conflicts*. Recoupment should be considered only in instances when it would not legally conflict with existing legislative authority of the agency involved.

It has been suggested that recoupment may conflict with existing legislative authority of agencies such as NASA, ERDA, and Agriculture that have been given responsibilities for exchange or dissemination of information and encouragement of widespread use of that information. The possible conflict here is partly dependent on the responsiveness of demand to changes in price, and on the market structure of the commercial seller/producer of the government funded R&D. If such seller is in a competitive market and/or sales are likely to be significantly reduced by the price difference attributable to recoupment charges, technology may not diffuse as widely as it otherwise would. That is, higher prices due to recoupment may impede diffusion. Whether or not this would legally conflict with some agencies' charters is not known, but should be considered when making recoupment decisions. Other legal agreements such as Patent Inter-

change Agreements made with some countries should also be examined for potential conflict.

(8) *Policy Conflicts*. Recoupment should be considered if it does not conflict with important and overriding concerns of national security, foreign policy, or other public considerations.

This guideline goes to the original intent of the R&D funding, or of the sale of the product or technology resulting from the R&D. In some instances, especially where sales to foreign countries are involved, military or foreign policy considerations may outweigh recoupment considerations. Cases involving national security, foreign policy, or other such considerations must be decided on a case by case basis.

(9) *Buyer*. Recoupment, where called for under other guidelines, should be applied to any sale, whether foreign or domestic, outside the Federal Government.

Recoupment should not be used as an instrument to inhibit the transfer of technology abroad relative to its transfer domestically. As a result, distinctions should not be made based on the buyer of the product or technology, and exceptions should not be made on a foreign/domestic difference alone.

(10) *Equity among Firms*. Recoupment should be considered where R&D is within control of the U.S. government as opposed to being subject to an agreement with other countries.

Where support of R&D is by joint agreement with other countries, and dissemination and use of the results is not under control of the U.S. government, recoupment from U.S. firms might result in discrimination against these firms. Exceptions should be made if this is likely to occur.

Agencies entering into agreements with counterparts in foreign countries relating to joint sponsorship of R&D should consider the inclusion of specific language in such agreements covering the division of returns to the sponsoring governments from commercial exploitation of the resulting technology.

GENERAL PROCEDURAL GUIDELINES

The above guidelines address the question "In what situations should recoupment of Government R&D expenditures be considered?" Once candidate technologies have been chosen, the following procedural guidelines are suggested, based partly on the CIEP Decision Memorandum.

When: Specify recoupment at time of bidding and contracting.

Who: Applies to any non-Federal government sale of a product or technology developed in whole or in part with Federal government support (see Guidelines).

How Much: For products, an attempt should be made to recoup on a pro-rata basis by (a) estimating total government R&D costs for the product, (b) estimating expected sales, and (c) establishing a "pro-rata" amount per item, by distributing total R&D costs to be recouped over expected sales. This allocation may be made after the R&D has been done and commercial possibilities become apparent, provided the rights of the government to do so are reversed in the R&D contract. Where infeasible to establish recoupment in this way, a percent of the sales price may be recouped for a particular product. This is not to be interpreted as an *ad valorem* tax, since it should be

derived from typical experience in distributing costs in a pro-rata way. It is a cost allocation.

Where technology, in contrast to a physical product, is owned by the government, as in a patent or copyright, exclusive rights to use of this technology should be transferred at a price based on market demand or the value to the buyer as reflected in demand. Non-exclusive licenses to government held patents will generally not sustain more than a nominal fee applied equally to all licensees.

APPENDIX L

THE INTERDEPARTMENTAL COMMITTEE FOR ATMOSPHERIC SCIENCES:
A CASE HISTORY

PREPARED BY ROBERT E. MORRISON

SPECIALIST IN EARTH SCIENCES
SCIENCE POLICY RESEARCH DIVISION
CONGRESSIONAL RESEARCH SERVICE

THE INTERDEPARTMENTAL COMMITTEE FOR ATMOSPHERIC SCIENCES

ESTABLISHMENT AND PURPOSE

The Interdepartmental Committee for Atmospheric Sciences (ICAS), one of the standing committees of the Federal Council for Science and Technology (FCST), is the principal mechanism for coordination of research in atmospheric sciences within the Federal government. In 1959 the Council established the ICAS, whose functions were to identify the atmospheric science research programs of all government agencies and to make appropriate recommendations to the Council regarding these programs and associated matters. The three principal functions of the ICAS are specified as:¹

To survey and evaluate the national research effort in the atmospheric sciences,

To examine the role and activities of Federal agencies therein, and

To make recommendations for appropriate allocation of responsibilities among the Federal agencies.

In addition to its primary duties, the ICAS also performs special tasks, from time to time, at the direction of the Chairman of the FCST.

The ICAS has been in continuous existence since 1959 and meets monthly, except in August, to consider matters relating to research and technology in atmospheric sciences. Additional special meetings have been held when required.

MEMBERSHIP

The members of ICAS, currently numbering eleven, represent the Federal organizations which conduct research in atmospheric sciences as well as the Department of State. There are also a number of official observers from other Federal entities. A list of the current member agencies follows:

Department of Agriculture,

Department of Commerce,

Department of Defense,

Department of the Interior,

Department of Transportation,

Department of State,

Environmental Protection Agency,

Energy Research and Development Administration,

National Aeronautics and Space Administration,

National Science Foundation.

¹ Federal Council for Science and Technology. Interdepartmental Committee for Atmospheric Sciences. National Atmospheric Sciences Program: Fiscal Year 1975. ICAS 18—FY75. May 1974. p. iii.

Official Observers include representatives from the following activities:
 Department of Housing and Urban Development,
 Council on Environmental Quality,
 Interagency Committee for the World Weather Program.
 Interdepartmental Committee for Applied Meteorological Research,
 National Advisory Committee on Oceans and Atmosphere,
 Office of Management and Budget,
 Scientific, Technological, and International Affairs Directorate
 (NSF),
 U.S. Arms Control and Disarmament Agency.

In the past, ICAS member agencies have also included the Department of Health, Education, and Welfare; the Federal Communications Commission; the Federal Aviation Administration, before its incorporation into the Department of Transportation; and the Atomic Energy Commission, prior to formation of the Energy Research and Development Administration. Observers have previously included personnel from the President's Science Advisory Committee, the Office of Science and Technology, the Federal Council for Science and Technology, the Federal Communications Commission, and the Federal Coordinator for Meteorological Services and Supporting Research.

Dr. Edward P. Todd of the National Science Foundation (NSF) is the current ICAS Chairman. Previous Chairmen were Alan T. Waterman of NSF; Assistant Secretaries of Commerce for Science and Technology J. Herbert Hollomon, John F. Kincaid, Myron Tribus, and James H. Wakelin, Jr.; and Carl H. Savit of the Office of Science and Technology. The present Executive Secretary is Hugh W. Albers of NSF, who was preceded by Sherman W. Betts, who served in that position from the formation of the Committee until 1971.

In conducting its business, ICAS makes a concerted effort to assist its members in keeping in touch with activities in atmospheric science. This is accomplished in part through reviews at Committee meetings of ongoing atmospheric science research projects by program managers or laboratory scientists and through a visiting program, by which Committee members are taken to sites where research programs are underway. Such sites visited in recent years include the facilities in Boulder, Colorado, of the National Oceanic and Atmospheric Administration (NOAA), the National Bureau of Standards, and the National Center for Atmospheric Research; the National Aeronautics and Space Administration's Goddard Space Flight Center at Greenbelt, Maryland; and the NOAA research laboratories in the Miami, Florida, area.

PANELS AND SUBCOMMITTEES

In order to execute its functions effectively, the ICAS has formed standing and ad hoc panels and committees whose members are drawn from research organizations of the ICAS member agencies. The following panels and ad hoc subcommittee are currently active:

- Panel on Weather Modification,
- Panel on Inadvertent Modification of Weather and Climate,
- Panel on the St. Louis Air Pollution Study,
- Panel on Aeronomy,
- Panel on the International Magnetospheric Study,
- Ad hoc Subcommittee on Instruments and Measuring Systems.

Through 1975 the ICAS was also the parent committee for another permanent group, the Joint Committee for Space Environmental Forecasting. This committee no longer reports to the ICAS, however, since responsibilities for its functions have been transferred to the Federal Committee for Meteorological Services and Supporting Research. Numerous other ad hoc subcommittees and panels have been formed to undertake studies and prepare reports on particular subjects or problems in atmosphere science. These ad hoc groups have been disbanded by the ICAS as the tasks were completed.

COORDINATION WITH OTHER COMMITTEES

To fulfill its purposes ICAS remains in close contact with other groups and organizations that are concerned with atmospheric sciences. Since much research conducted by ICAS member agencies applies ultimately to meteorological service activities, the ICAS maintains close liaison with the Federal Committee for Meteorological Services and Supporting Research, which reports to the Secretary of Commerce. Committees under the cognizance of the Federal Committee, additional FCST committees, and other Federal committees with which the ICAS coordinates its activities, or from which it receives advice include:

Interdepartmental Committee for Applied Meteorological Research (ICAMR),

Interagency Committee for the World Weather Program (ICWWP),

Interagency Arctic Research Coordination Committee (IARCC),
Interagency Committee for Marine Science and Engineering (ICMSE),

Interagency Committee for Marine Environmental Prediction (ICMAREP),

National Advisory Committee on the Oceans and Atmosphere (NACOA).

In addition to interchanges with these Federal committees, the ICAS considers the opinions and guidance of the National Academy of Sciences Committee on Atmospheric Science (NAS/CAS). Through contacts with these and other organizations the ICAS seeks to insure that the research programs over which it exercises coordination responsibilities are responsive to Government and public needs, that there are no avoidable significant gaps in these programs, and that only justifiable duplications of effort exist.

ICAS ACTIVITIES

ANNUAL REPORT

The ICAS prepares a report annually on the National Atmospheric Sciences Program.² In recent years, this report has been prepared in the spring and serves a number of essential and useful purposes. It is intended primarily to afford visibility to the total federally supported program of ongoing research and planned effort in atmospheric

² The following is the most recent annual report: Federal Council for Science and Technology. Interdepartmental Committee for Atmospheric Sciences. National Atmospheric Sciences Program: Fiscal Year 1977. ICAS 20-FY77. May 1976, 103 p.

sciences to the executive and legislative branches of the Government. The report is also widely circulated in non-Federal circles, to State and local governments, to the university community, and to interested private industrial organizations. The report includes discussions and funding information for atmospheric sciences programs for the several member agencies as well as total funding by agency and category for the National Atmospheric Sciences Program. In addition, recent issues of the annual report have included detailed discussions of particular fields of special interest such as weather modification and severe storms.

EARLY COMMITTEE STUDIES

In May of 1960 the ICAS published its first report, which provided the first survey and evaluation of the Federal Government's program in atmospheric sciences, agency by agency, and defined the scope and categories of research to be reported and coordinated by the Committee.³ In July of 1960 a second ICAS report identified promising areas in U.S. atmospheric sciences and presented the following recommendations for advancing atmospheric sciences through these designated areas:⁴

1. *Manpower and education in atmospheric sciences.*—The Committee felt that it was feasible and desirable to double the number of Ph. D.'s being graduated per year by 1966, and the Committee felt that it was important to provide programs for post-doctoral research and education in atmospheric sciences.

2. *National Center for Atmospheric Research (NCAR)*, recently established by the National Science Foundation.—The Committee agreed that the Center was essential to the well-balanced growth of the atmospheric sciences and that it should be developed and supported vigorously.

3. *Properties and composition of the atmosphere.*—The Committee recommended that increased support be given to the development of improved methods for trace analysis and that regular samplings of gaseous pollutants be undertaken from a variety of geographical locations.

4. *Severe storms.*—The Committee felt the national welfare required that over the next several years at least twice the current amount of research should be devoted to the severe storm problem.

5. *Extra-terrestrial effects.*—The Committee recommended that continued and increasing support be given to the study of the energetic particles, meteoric dust, and fields of the upper atmosphere as they relate to the study of the atmosphere.

6. *Satellite meteorology.*—The Committee felt that the national welfare would benefit by the development of earth oriented satellites with sensory equipment providing continuous world-wide coverage of meteorological data, and that "meteorology" should expand to incorporate efficiently the data so acquired.

In the third ICAS report it was noted that "the atmospheric sciences are undergoing great development and expansion. There is plenty of

³ Federal Council for Science and Technology. Interdepartmental Committee for Atmospheric Sciences. Status Report on Atmospheric Sciences in the Federal Government. ICAS Report No. 1. May 1960. 17 p.

⁴ Federal Council for Science and Technology. Interdepartmental Committee for Atmospheric Sciences. Further Remarks on the Atmospheric Sciences in the Federal Government with Special Attention to Certain Promising Areas. ICAS Report No. 2. July 1960. p. 2-4.

work for as many people and dollars as could plausibly become available because the atmospheric sciences are endowed with an extraordinarily rich variety of important unanswered questions.”⁵ The use of new tools—including new radar and balloon technology; instrumented aircraft, rockets, and satellites; and electronic computers—to further this research was noted as an “explosive development.”⁶ The fourth ICAS report⁷ was devoted to an evaluation of the recently published report of the Committee for Atmospheric Sciences of the National Academy of Sciences (NAS), which outlined a recommended program in atmospheric sciences for the decade, 1961–71.⁸ The ICAS endorsed the NAS report and selected the following ten recommended initiatives to be highlighted for early consideration by Federal agencies in their research programs:⁹

1. A major program of regular synoptic rocket probes into the mesosphere and lower ionosphere to investigate the link between solar activity and the behavior of the lower atmosphere.

2. A program of measurements and studies of the spatial and temporal variations of all important trace substances over North America and adjoining oceans, with extension as far as possible into Europe. (The trace substances include ozone, methane, various oxides of nitrogen and sulfur, and several radioactive gases.)

3. Theoretical, experimental, and field studies of dispersion of pollutants emanating from point, line, and area sources, with special emphasis on the behavior of pollutants from area sources of city dimensions.

4. In cloud physics and weather modification, a program of theoretical studies and numerical and tank experiments to explore the possibility of modifying climatic patterns by altering the physical properties of the earth's surface and thereby influencing the manner in which the solar energy is used. (The most urgent facility need noted was the design and construction of a large cloud chamber to serve a variety of controlled experiments.)

5. A major effort to develop an understanding of the general circulation of the atmosphere; the associated energy and momentum balances; the modifications due to mountains, oceans, and continents; and the nature of its variations. (Coupled with this was a recommendation that the three existing model experimental laboratories be increased in number to about twelve by the end of the ten-year period.)

6. Formation of a study group of interested biologists and meteorologists to review the recommendations of the NAS report in biometeorology.

7. An intensive study of a limited ocean basin with a view to obtaining basic knowledge of atmospheric processes in which the ocean temperature and circulation play important parts.

⁵ Federal Council for Science and Technology. Interdepartmental Committee for Atmospheric Sciences. *Atmospheric Sciences in the Federal Government: Fiscal Year 1962; with Projections for fiscal year 1963 and Remarks on Some Areas of Program Deficiency and Specific Opportunity*. ICAS Report No. 3. June 15, 1961. p. 1.

⁶ *Ibid.*

⁷ Federal Council for Science and Technology. Interdepartmental Committee for Atmospheric Sciences. *The Atmospheric Sciences, 1961–71: Federal Government Comment on the Report of the Committee on Atmospheric Sciences, National Academy of Sciences*. ICAS Report No. 4. October 17, 1961. 16 p.

⁸ National Academy of Sciences—National Research Council. *Committee on Atmospheric Sciences. The Atmospheric Sciences, 1961–71*. Publication 946, Washington, D.C., 1962. (A report to the Special Assistant to the President for Science and Technology) 240 p. (in three volumes).

⁹ Federal Council for Science and Technology. Interdepartmental Committee for Atmospheric Sciences. ICAS Report No. 4, October 17, 1961. p. 5–7.

8. A major effort to take full advantage of the considerable advances in balloon technologies which were clearly in sight in order to advance observational and experimental programs.

9. A major experimental field facility to provide means for experiments with, and measurements of, a number of atmospheric phenomena, particularly of the smaller scale variety. (The core of the facility was to be an experimental area of about 15x15 miles with maximum density of stations and probes, surrounded by a 50x50 mile network, embedded within the existing 500x500 mile network supporting research on severe storms in the mid-west.)

10. Support for establishment of an International Atmospheric Sciences Program as a means for developing and channeling new scientific capabilities into a concerted effort for the benefit of man.

These and earlier recommendations were developed by the ICAS during its first three years of existence. ICAS felt that this was a period during which the atmospheric sciences were first being identified as an area of research of "considerable importance to the national well being."¹⁰ It was also a period during which the level of Federal budget support for such research was increasing over 40 per cent each year, though Federal support essentially leveled off thereafter.¹¹ ICAS noted in January 1967 that, with the exception of the mesoscale experimental field facility and the large cloud chamber, "very significant progress" had been made toward carrying out their recommendations.¹²

In addition to providing the results of the 1962 annual spring review of major aspects of the atmospheric sciences, ICAS Report No. 5 focussed attention on major program issues in atmospheric sciences. These issues, which in the opinion of ICAS required early consideration at the national level, were:¹³

1. The shortage of skilled manpower.
2. The emergence of international programs; five such major programs planned or underway were identified:
 - (a) Satellite and rocket meteorology programs
 - (b) The International Indian Ocean Expedition (1962-64)
 - (c) The International Year of the Quiet Sun (1964-65)
 - (d) Atmospheric sciences section of the U.N. General Assembly resolution on International Cooperation in the Peaceful Uses of Outer Space (Resolution 1721 (XVI) of December 20, 1961)
 - (e) Recommended programs in atmospheric science from the United States-Japan Committee on Scientific Cooperation (May 24, 1962).
3. Increasing need for establishment of a synoptic meteorological rocket program.
4. Investigation of tornadoes and other local storms under the National Severe Storms Project (project supported by Commerce, Defense, NASA, and FAA).

¹⁰ Federal Council for Science and Technology. Interdepartmental Committee for Atmospheric Sciences. National Atmospheric Sciences Program: Fiscal Year 1968. ICAS Report No. 11. January 1967. p. 2.

¹¹ *Ibid.*

¹² *Ibid.*

¹³ Federal Council for Science and Technology. Interdepartmental Committee for Atmospheric Sciences. Selected Program Issues in the Atmospheric Sciences; A Contribution to the 1962 Spring Review of Science and Technology in the Federal Government, Conducted by the Federal Council for Science and Technology. ICAS Report No. 5. May 29, 1962. pp. 2-7.

5. Continuation of substantial Federal support in research and development aimed at a common aviation weather system.

6. Legislation permitting continuing and expansion of research on air pollution by Health, Education, and Welfare [prior to establishment of the EPA].

7. Timely development of the National Center for Atmospheric Research (NCAR) (supported by the National Science Foundation).

The recommendations and issues identified by the ICAS during its earlier years were followed in subsequent years by the Committee, and progress on each was reported in the annual reports. In 1963 an ad hoc panel on Manpower was established, and a joint ad hoc panel of ICAS and the Interdepartmental Committee on Oceanography (ICO) was formed to develop recommendations for research in air/sea interaction.¹⁴ Later in that same year, in an attempt to determine the status of atmospheric sciences and the proper direction for future research, the ICAS embarked on a new comprehensive review.¹⁵ Task groups were set up within member agencies to analyze designated objectives of the National Research Program in the Atmospheric Sciences. These objectives and the agencies responsible for analysis in each were:¹⁶

1. To improve the means of description and the prediction of the weather for social and economic purposes. (Commerce)

2. To facilitate observation, prediction, modification, and control of the atmospheric environment for military needs. (Defense)

3. To permit the modification and control of the weather for useful purposes other than military. (NSF)

4. To anticipate and ameliorate the harmful effects of atmospheric pollution—whether from radiation, smoke and chemical impurities, or changes in the natural gaseous mixture of the atmosphere. (HEW)

5. To contribute to the development and effective utilization of natural resources. (Interior)

6. To contribute to the space exploration through the understanding of the atmospheres of the earth and other planets. (NASA)

7. To facilitate communication by electromagnetic propagation through the atmosphere. (Commerce)

8. To contribute to the aims of our foreign policy and actions through international cooperation in the atmospheric sciences. (State)

An additional objective of the National Program was identified subsequently:

9. To contribute to the basic scientific understanding of the behavior of the atmosphere.

Analysis of these objectives was to be completed by the task groups by April 1964 in order to assist in fiscal year 1966 program planning; however, this was not totally accomplished, owing to the number of diverse projects in the several agencies contributing to these objectives and to the extensive time necessary for coordination. Nevertheless,

¹⁴ Federal Council for Science and Technology, Interdepartmental Committee for Atmospheric Sciences, Spring Review of the Federal Atmospheric Sciences Program: Fiscal Year 1965; with Projections through Fiscal Year 1968, ICAS Report No. 7, May 28, 1963, p. 1.

¹⁵ Federal Council for Science and Technology, Interdepartmental Committee for Atmospheric Sciences, National Atmospheric Sciences Program: Fiscal Year 1965, ICAS Report No. 8, October 16, 1963, p. 7.

¹⁶ *Ibid.*

substantial progress had been made, resulting in some tentative conclusions and identification of deficiencies.¹⁷

During 1964 the ICAS submitted recommendations on the development of the potential for weather modification and on improvement in electromagnetic communications.¹⁸

As a result of continuous review of atmospheric science programs, four specific scientific problem areas were identified by ICAS in 1965 and were made subjects of studies by competent scientists.¹⁹ Recommendations from these studies were transmitted by ICAS to the Federal Council and had a decided effect on agency programs and budget proposals for fiscal year 1967. These recommendations are summarized below:²⁰

1. *Weather modification*.—It was recommended that:

(a) A well-planned, intensive investigation of the physical processes of orographic precipitation should be undertaken.

(b) The Weather Bureau should conduct research and, if feasible, carry on practical work in weather modification.

(c) New programs should in no way impair the continued growth of the programs of basic and background research in weather modification, primarily under the aegis of the National Science Foundation.

(d) The NSF should develop a comprehensive national plan for weather modification.

2. *Electromagnetic telecommunications*.—It was recommended that:

(a) There should be a gradual change in emphasis toward more research concerning tropospheric propagation of the high radio frequencies and of the infrared and visible frequencies, including a modest increase in overall funding.

(b) The mission of the Institute for Telecommunications Science and Aeronomy (ITSA) should be broadened to cover the entire electromagnetic spectrum and ITSA should establish such programs as to achieve recognition as the central Federal research organization in this area.

(c) ITSA should greatly improve its capability to translate its research into terms of more general engineering utility.

3. *Space environmental forecasting*.—It was recommended that:

(a) A national program in space environmental forecasting should be identified and ITSA should be given the clear responsibility for coordinating and supplementing, where necessary, the efforts to meet the common need of the country for space environmental information.

(b) ITSA should assume the responsibility for future support of the worldwide solar activity patrol.

(c) A vigorous research program in solar physics and solar-terrestrial relationships should be supported.

(d) An increase of \$.75 million for FY 1966 and \$1 million for FY 1967 should be provided to implement these recommendations.

¹⁷ Federal Council for Science and Technology. Interdepartmental Committee for Atmospheric Sciences. National Atmospheric Sciences Program: Fiscal Year 1966. ICAS Report No. 9, October 16, 1964, pp. 5-8.

¹⁸ *Ibid.*, p. 9.

¹⁹ Federal Council for Science and Technology. Interdepartmental Committee for Atmospheric Sciences. National Atmospheric Sciences Program: Fiscal Year 1967. ICAS Report No. 10, January 1966, p. 5.

²⁰ *Ibid.*, pp. 5-7.

4. *Air-sea interaction*.—ICAS endorsed a Department of Commerce report as a minimal program for augmenting existing agency efforts, recognizing, however, that this report did not yet constitute the comprehensive air-sea interaction research program deemed necessary to meet the Government's responsibilities in this area. This report recommended certain area studies, laboratory studies, and observational improvement programs which should be carried out by the Department of Commerce, the National Science Foundation, and the Office of Naval Research.

INTERNATIONAL INTERESTS

In its January 1966 report, the ICAS recognized the "newly developing and truly exciting program" in general circulation research which was associated with the World Weather Watch.²¹ The Committee considered the establishment of a "truly global observation system," based on a feasibility study by the National Academy of Sciences—Committee on Atmospheric Sciences.²² Associated with the observation system there was proposed a very greatly expanded research program in the general circulation of the atmosphere.

International aspects of atmospheric science research have continued to receive attention from the ICAS. During 1967 a special effort was made by the Committee to promote increased cooperation with and support of university research groups by Government agencies in connection with U.S. participation in the Global Atmospheric Research Program (GARP), the research portion of the World Weather Program.²³ It was the conviction of ICAS that its continued consideration of international programs promoted "optimum interaction" between the research activities of the World Weather Program and the broad atmospheric science research activities being carried on to achieve U.S. national goals.²⁴

Though international aspects of atmospheric sciences continue to receive attention from ICAS, coordination and detailed review of the U.S. contribution to GARP is the responsibility of the Interagency Committee for the World Weather Program (ICWWP). This Committee acts for the Secretary of Commerce and prepares an annual report from the President to Congress on U.S. participation in the World Weather Program. The first such report was published in 1969.²⁵ International programs and experiments, that have recently been completed, are underway, or are being planned, which the ICAS has followed carefully in connection with its responsibility of coordinating U.S. atmospheric sciences research include:

1. The Barbados Oceanographic and Meteorological Experiment (BOMEX),
2. The GARP Atlantic Tropical Experiment (GATE),
3. The First GARP Global Experiment (FGGE),

²¹ *Ibid.*, p. 7.

²² National Academy of Sciences—National Research Council, Committee on Atmospheric Sciences. Panel on International Meteorological Cooperation. *The Feasibility of a Global Observation and Analysis Experiment*. Publication 1290. Washington, D.C., 1966.

²³ Federal Council for Science and Technology. Interdepartmental Committee for Atmospheric Sciences. *National Atmospheric Sciences Program: Fiscal Year 1969*. ICAS Report No. 12, January 1968, p. 3.

²⁴ *Ibid.*, p. 5.

²⁵ Federal Coordinator for Meteorological Services and Supporting Research. Interagency Committee for the World Weather Program. *World Weather Program: Plan for Fiscal Year 1970*. March 1, 1970, 26 pp.

4. The International Indian Ocean Expedition (IIOE),
5. The International Year of the Quiet Sun (IQSY),
6. The International Field Year of the Great Lakes (IFYGL),
7. The International Decade of Ocean Exploration (IDOE),
8. The International Magnetospheric Study (IMS).

WEATHER MODIFICATION

A subject which has received considerable attention from the ICAS, beginning in the early 1960's and of increasing concern since, is weather modification. Recently, the Chairman of the ICAS stated that the Committee spends more time on weather modification than on any other single topic.²⁶ The ICAS is and has been the principal coordinating agent for U.S. agency research in weather modification. This coordination is accomplished formally through reviews at ICAS meetings of the major weather modification programs of member agencies, through the activities of standing and *ad hoc* panels that are assigned responsibilities for specific facets of the weather modification program, and through sponsorship of an annual Interagency Conference on Weather Modification. The latter, usually held in the fall and attended by both Washington program managers and field program managers, includes reports on progress in past years, plans for the coming year, and discussions on problem areas.

Two reports on weather modification have been published by the ICAS, both presenting recommended plans for a national weather modification program.^{27, 28}

In addition there have been numerous documents, internal to the ICAS, on subjects such as weather modification regulation, reporting, and legislation. In recent annual reports, the ICAS has also included an appendix on the Federal weather modification program. This appendix includes descriptions of agency activities and funding as well as summary funding for the Federal program.

At the request of ICAS and with the cooperation of the Secretary of Commerce, Federal agencies began to report their experimental activities in weather modification to NOAA as of November 1, 1973.²⁹ Public Law 92-205 requires such reporting by all non-federally sponsored weather modification activities in the United States and its territories. This voluntary reporting by Federal agencies, initiated by the ICAS, thus assures that the central source of information on weather modification projects conducted in the United States is reasonably complete.

²⁶ Edward P. Todd (Chairman of the Interdepartmental Committee for Atmospheric Sciences) in testimony for hearings on weather modification before the Subcommittee on Environment and the Atmosphere, Committee on Science and Technology, U.S. House of Representatives, June 16, 1976.

²⁷ Homer E. Newell, A Recommended National Program in Weather Modification, Federal Council for Science and Technology, Interdepartmental Committee for Atmospheric Sciences, ICAS Report No. 10a, November 1966, 93 p.

²⁸ Federal Council for Science and Technology, Interdepartmental Committee for Atmospheric Sciences, A National Program for Accelerating Progress in Weather Modification, ICAS Report No. 15a, June 1971, 50 p.

²⁹ Federal Council for Science and Technology, Interdepartmental Committee for Atmospheric Sciences, National Atmospheric Sciences Program: Fiscal Year 1975, ICAS 18-FY75, May 1974, p. iv.

In its 1971 annual report, the ICAS identified selected research projects in weather modification which were designated as National Projects.³⁰ These National Projects were formulated by combining agency projects in each of seven categories of weather modification and assigning lead agency responsibility in most cases to that agency with the most significant program(s) within the category. The proposed National Projects and lead Agencies are:

1. *National Colorado River Basin Pilot project*.—Bureau of Reclamation, Department of the Interior. To test the feasibility of applying a cloud seeding technology, proven effective under certain conditions, to a river basin for a winter season to augment the seasonal snowpack.

2. *National hurricane modification project*.—National Oceanic and Atmospheric Administration, Department of Commerce. To develop a seeding technology and associated mathematical models to reduce the maximum surface winds associated with hurricanes.

3. *National lightning suppression project*.—Forest Service, Department of Agriculture. To develop a seeding technology and associated physical and mathematical models to reduce the frequency of forest fire-starting lightning strokes from cumulonimbus clouds.

4. *National cumulus modification project*.—National Oceanic and Atmospheric Administration, Department of Commerce. To develop a seeding technology and associated mathematical models to promote the growth of cumulus clouds in order to increase the resulting natural rainfall in areas where needed.

5. *National hail research experiment*.—National Science Foundation. To develop a seeding technology and associated mathematical models to reduce the incidence of damaging hailfall from cumulonimbus clouds without adversely affecting the associated rainfall.

6. *National Great Lakes snow redistribution project*.—National Oceanic and Atmospheric Administration, Department of Commerce. To develop a seeding technology and associated mathematical models to spread the heavy snowfall of the Great Lakes coastal region farther inland.

7. *National fog modification project*.—Federal Aviation Administration, Department of Transportation. To develop seeding or other technology and associated physical and mathematical models to reduce the visibility restrictions imposed by warm and cold fogs, where and to the extent needed.

OTHER RECENT ICAS STUDIES

At the direction or request of the ICAS, studies have been conducted in recent years on other topics by ICAS sub-groups or by task groups within member agencies. In 1973 the ICAS forwarded to the FCST an internal report on research in the stratosphere.³¹ In another investi-

³⁰ Federal Council for Science and Technology. Interdepartmental Committee for Atmospheric Sciences. National Atmospheric Sciences Program: Fiscal Year 1972. ICAS Report No. 15, March 1971. pp. 5-6.

³¹ Federal Council for Science and Technology. Interdepartmental Committee for Atmospheric Sciences. National Atmospheric Sciences Program: Fiscal Year 1975. ICAS 18-FY75. May 1975. p. iv.

gation, undertaken by ICAS at the request of the National Advisory Committee on the Oceans and Atmosphere, a survey report was prepared, under contract, on the capital structure supporting atmospheric sciences to determine its future adequacy.³²

In 1974 the ICAS ad hoc Panel on the Present Interglacial published a report on its findings on long-term climate changes.³³ The threats of future cold temperatures and the climatic fluctuations which accompany the close of the present warm period are subjects of major concern today. The report concluded that (a) no methods exist for making specific predictions on the termination of the present interglacial, (b) adverse climatic effects which accompany termination of the interglacial cannot be understood without more climate modeling, (c) socio-economic and international consequences of climatic disturbances depend on specifics of the climate change and such impacts cannot, therefore, be generalized, and (d) attempts to mitigate climate changes could be potentially dangerous without a thorough understanding of climatic processes. The Panel noted that there is some basis for supposing that inadvertent human interference in climatic processes may prolong the present interglacial rather than bring on its premature end.³⁴

In 1975, an ICAS report, prepared by the Panel on Inadvertent Modification of Weather and Climate, was published on possible impact on ozone of fluorocarbons and halocarbons.³⁵ The report summarized the state of knowledge on the subject as of May 1975 and noted that there is a continuing massive research effort in progress. Material from this report was abridged and included in a chapter of the report of the Council on Environmental Quality/Federal Council for Science and Technology Joint Task Force on Inadvertent Modification of the Stratosphere (IMOS).³⁶

In addition to the ICAS annual report for the fiscal year 1977 National Atmospheric Sciences Program, two other special ICAS reports are in current preparation. A "National Climate Program Plan," prepared under the auspices of the Panel on Weather Modification, will be reviewed in draft by the ICAS later in 1976. A "National Plan for Upper Atmosphere Research," is being prepared for the ICAS by a special ad hoc working group headed by NOAA.³⁷

³² Richard A. Kuzmack (study director). *The Capital Structure Supporting Atmospheric Research*. Center for Naval Analyses, CNS 1052, Arlington, Va., January 1975. 53p.

³³ Federal Council for Science and Technology. *Interdepartmental Committee for Atmospheric Sciences. Report of the Ad Hoc Panel on the Present Interglacial*. ICAS 18b-FY75, August 1974. 22 p.

³⁴ *Ibid.*, iv-v.

³⁵ Federal Council for Science and Technology. *Interdepartmental Committee for Atmospheric Sciences. The possible Impact of Fluorocarbons and Halocarbons on Ozone*. ICAS 18a-FY75. Washington, U.S. Government Printing Office, May 1975. 75 p.

³⁶ Council on Environmental Quality and Federal Council for Science and Technology. *Federal Task Force on Inadvertent Modification of the Stratosphere (IMOS). Fluorocarbons and the Environment*. Washington, U.S. Government Printing Office, June 1975. 109 p.

³⁷ As a result of implementation of P.L. 94-282 some efforts currently under way under the auspices of the ICAS may be redirected; consequently, either or both of these reports may not be published.

ICAS REPORTS

PUBLISHED REPORTS

The following list contains the reports which have been published under ICAS cognizance since inception of the Committee:

Federal Council for Science and Technology. Interdepartmental Committee for Atmospheric Sciences. Status Report on Atmospheric Sciences in the Federal Government. ICAS Report No. 1. May 1960. 17 p.

— Further Remarks on the Atmospheric Sciences in the Federal Government with Special Attention to Certain Promising Areas. ICAS Report No. 2. July 1960. 8 p.

— Atmospheric Sciences in the Federal Government: Fiscal Year 1962; with Projections for Fiscal Year 1963 and Remarks on Some Areas of Program Deficiency and Special Opportunity. ICAS Report No. 3. June 15, 1961. 20 p.

— The Atmospheric Sciences, 1961-71. Federal Government Comment on the Report of the Committee on Atmospheric Sciences, National Academy of Sciences, entitled "The Atmospheric Sciences, 1961-71." ICAS Report No. 4. October 17, 1961. 16 p.

— Selected Program Issues in the Atmospheric Sciences; A Contribution to the 1962 Spring Review of Science and Technology in the Federal Government, Conducted by the Federal Council for Science and Technology. ICAS Report No. 5. May 29, 1962. 9 p.

— National Atmospheric Sciences Program: Fiscal Year 1964; with Projections to Fiscal Year 1967. ICAS Report No. 6. September 5, 1962. 32 p. (A supplement to ICAS Report No. 6, containing revised agency program plans and fiscal data, was distributed November 7, 1962.)

— Spring Preview of the Federal Atmospheric Sciences Program: Fiscal Year 1965; with Projections Through Fiscal Year 1968. ICAS Report No. 7. May 28, 1963. 25 p.

— National Atmospheric Sciences Program: Fiscal Year 1965. ICAS Report No. 8. October 16, 1963. 45 p. (A supplement to ICAS Report No. 8, containing revised agency program descriptions and fiscal data, was distributed February 4, 1964.)

— National Atmospheric Sciences Program: Fiscal Year 1966. ICAS Report No. 9. October 16, 1964. 55 p.

— National Atmospheric Sciences Program: Fiscal Year 1967. ICAS Report No. 10. January 1966. 48 p.

Newell, Homer E. A Recommended National Program in Weather Modification. Federal Council for Science and Technology. Interdepartmental Committee for Atmospheric Sciences. ICAS Report No. 10a. November 1966. 93 p.

- Federal Council for Science and Technology. Interdepartmental Committee for Atmospheric Sciences. National Atmospheric Sciences Program: Fiscal Year 1968. ICAS Report No. 11, January 1967. 53 p.
- National Atmospheric Sciences Program: Fiscal Year 1969. ICAS Report No. 12. January 1968. 62 p.
- National Atmospheric Sciences Program: Fiscal Year 1970. ICAS Report No. 13. January 1969. 64 p.
- National Atmospheric Sciences Program: Fiscal Year 1971. ICAS Report No. 14. January 1970. 66 p.
- National Atmospheric Sciences Program: Fiscal Year 1972. ICAS Report No. 15. March 1971. 77 p.
- A National Program for Accelerating Progress in Weather Modification. ICAS Report No. 15a. June 1971. 50 p.
- National Atmospheric Sciences Program: Fiscal Year 1973. ICAS 16—FY75. May 1972. 111 p.
- National Atmospheric Sciences Program: Fiscal Year 1974. ICAS 17—FY74. May 1973. 100 p.
- National Atmospheric Sciences Program: Fiscal Year 1975. ICAS 18—FY75. May 1974. 95 p. NSF 74-400.
- Report of the *Ad Hoc* Panel on the Present Interglacial. ICAS 18b—FY75. August 1974. 22 p.
- The Possible Impact of Fluorocarbons and Halocarbons on Ozone. ICAS 18a—FY75. Washington, U.S. Government Printing Office, May 1975. 75 p. NSF 75-404.
- Kuzmack, Richard A. (study director) The Capital Structure Supporting Atmospheric Research. Center for Naval Analyses, CNS 1052, Arlington, Va., January 1975. (by Richard A. Kuzmack, Anne S. Jondrow, James E. Koehr, Susan E. Bender, and Robert F. Hale) 53 p.
- Federal Council for Science and Technology, Interdepartmental Committee for Atmospheric Sciences. National Atmospheric Sciences Program: Fiscal Year 1976. ICAS 19—FY76. May 1975. 82 p. NSF 76-405.
- Council on Environmental Quality and Federal Council for Science and Technology. Interagency Task Force on Inadvertent Modification of the Stratosphere. Report by the Interdepartmental Committee for Atmospheric Sciences (ICAS): Potential Hazards to the Stratosphere Posed by Substances Other than Fluorocarbons. March 1976. 11 p.
- Federal Council for Science and Technology. Interdepartmental Committee for Atmospheric Sciences. National Atmospheric Sciences Program: Fiscal Year 1977. ICAS 20—FY77. 103 p. NSF 76-402.

REPORTS IN PREPARATION

The following reports have been undertaken by the ICAS and are in some stage of preparation or final review:

National Climate Program Plan.

National Plan for Upper Atmosphere Research.

APPENDIX M
THE INTERAGENCY COMMITTEE ON OCEANOGRAPHY:

A CASE HISTORY

PREPARED BY JOHN R. JUSTUS

ANALYST IN EARTH SCIENCE
SCIENCE POLICY RESEARCH DIVISION
CONGRESSIONAL RESEARCH SERVICE

INTERAGENCY COMMITTEE ON OCEANOGRAPHY: A CASE HISTORY

BACKGROUND, ESTABLISHMENT, AND PURPOSE

The ocean has had special significance to the United States since colonial times, and the Federal Government has been active in ocean studies since the early 1800s. While neither the largest nor the most complex Federal scientific program, oceanography has attracted sustained attention of the Congress regarding the setting of goals, and planning and coordinating the ocean-related research and development conducted by 21 Federal organizations in six departments and five agencies. The level of these programs totaled \$864.0 million in fiscal year 1976. Oceanography also is notable because its history includes the formation of three different coordinating devices: the Interagency Committee on Oceanography (ICO), the National Council on Marine Resources and Engineering Development (abbreviated Marine Sciences Council, MSC), and the Interagency Committee on Marine Science and Engineering (ICMSE). A case history of the Interagency Committee on Oceanography is presented in this appendix.

In terms of recent history, the first move toward informal inter-departmental coordination developed in 1956 with formation of the Coordinating Committee on Oceanography (CCO), described by Rear Adm. John T. Hayward:

While the Navy is pursuing its own program in oceanography, the problems are so large and involve so many other groups that it has been found necessary to coordinate our research within the Department of Defense and other Government agencies. Within the DOD formal coordination is achieved through the Committee on Science which has designated service representatives to deal with oceanography. Coordination among other interested Government agencies is accomplished informally through the Coordinating Committee on Oceanography (CCO) established by the Office of Naval Research in 1956. This committee, consisting of representatives from all Federal agencies concerned with the oceans, has met regularly every month to discuss problems of mutual interest.¹

Then with regard to its functions, Admiral Hayward added:

The usefulness of the Coordinating Committee on Oceanography is attributed to its informality and to the rotation of the chairmanship among the member agencies. It is this group that will insure that a national program in oceanography is properly managed and well coordinated throughout the Federal agencies concerned.²

The Coordinating Committee on Oceanography included representatives from the following agencies:

Health, Education, and Welfare,
Public Health Service,
National Science Foundation,

¹ U.S. Congress. House. Committee on Merchant Marine and Fisheries. Special Subcommittee on Oceanography. Oceanography in the United States. Hearings. 86th Congress, 1st session. March 3, 10, 12, 17, April 21, 23, 24, June 1, 2, 23, July 13, 14, 1959. Washington. U.S. Govt. Print. Off., 1959. p. 135.

² *Ibid.*

Beach Erosion Board, Corps of Engineers,
 Bureau of Ships, U.S. Navy,
 Maritime Administration,
 Bureau of Commercial Fisheries, Fish and Wildlife Service,
 Office of Science, Department of Defense,
 Office of Naval Research,
 Bureau of Mines,
 Weather Bureau,
 Department of State,
 Geophysics Branch, U.S. Air Force,
 Atomic Energy Commission,
 U.S. Coast Guard,
 Hydrographic Office, U.S. Navy,
 Bureau of Weapons, U.S. Navy,
 U.S. Coast and Geodetic Survey,
 Committee on Oceanography, National Academy of Sciences.

By early 1959, three years after the CCO had been in operation, a number of events had spotlighted the allegedly neglected status of oceanography in the United States and, by virtue of the dominant role of Federal sponsorship, the question of adequate coordination. In particular, a National Academy of Sciences/Committee on Oceanography (NASCO) study begun late in 1957 was essentially complete, and its forceful recommendations for implementing an aggressive Federal effort in oceanography had been made public. Published in February 1959, this 12-volume report, *Oceanography 1960-70*, was prepared in response to a request dated August 9, 1956, from Rear Adm. Rawson Bennett—acting for the Office of Naval Research and three other Federal agencies—asking the National Academy of Sciences to provide advice and guidance on the opportunities and needs of oceanographic research. Also by early 1959, the Navy had itself developed a long-term program of contract oceanic research and development, known as TENOC (Ten Years in Oceanography). Finally, in a report of the President's Science Advisory Committee (PSAC), *Strengthening American Science*, still additional emphasis on the need for an accelerated oceanographic program was generated:

Oceanography is another promising field which has received inadequate attention. For the study of the oceans, the United States has only a few research vessels, all inadequately equipped. A vessel specifically designed and constructed for oceanographic research has not been built in this country since 1930.³

That same report recommended the establishment of a new Federal Council for Science and Technology (FCST) which, with Presidential approval, was subsequently formalized by Executive Order 10807 dated March 13, 1959.

In view of the publication of the various 10-year programs for oceanographic research, of simultaneously emerging needs for inter-departmental coordination, and of the President's directive concerning responsibilities of the FCST, action was catalyzed on several fronts. In the United States Senate, a resolution concurring in the NASCO recommendations passed unanimously (S. Res. 136). A Subcommittee on Oceanography was established by the House Committee

³ U.S. President's Science Advisory Committee, *Strengthening American Science*. Washington, U.S. Government Printing Office, 1958. pp. 6, 7.

on Merchant Marine and Fisheries. Legislation was enacted to strengthen the marine sciences by removing certain statutory limitations upon the Coast Guard, Coast and Geodetic Survey, and Geological Survey, enabling these agencies to participate in broader oceanographic work. In the executive branch, the NASCO recommendations were considered by the PSAC, which had earlier concluded that oceanography was a neglected field requiring additional emphasis. The PSAC endorsed the objectives of the report and commended it for action to the newly established FCST.

THE SUBCOMMITTEE ON OCEANOGRAPHY

In May 1959, the Chairman of the Federal Council, Dr. James Killian, established a Subcommittee on Oceanography with representatives from the Departments of Defense, Interior, and Commerce, the Atomic Energy Commission, the National Science Foundation, and the Bureau of the Budget. On July 16, 1959, Dr. Killian appointed Dr. James H. Wakelin, Jr., the Assistant Secretary of the Navy for Research and Development, to serve as chairman of the subcommittee. The charge to the subcommittee included the evaluation of the NASCO report and the examination of plans of the Federal agencies to meet the Nation's needs in the marine sciences.

The Subcommittee on Oceanography, in turn, examined ways by which an overall and integrated national program in oceanography might be initiated by the Federal Government. The subcommittee's September 1959 report recognized that,

The resources of the sea are of interest to every major department and agency of the Government, and that the strengthening of the marine sciences poses one of the most difficult problems of coordination in the organization of science in government.

It concluded that,

It is evident that procedures for formulating programs within the several agencies are well established but that there are deficiencies in coordination between agencies in providing adequate funding, and in the mechanisms for carrying out a coordinated national program.

Among its general recommendations were:

1. That as a national objective the Federal Government undertake a program for a substantial and orderly expansion of effort in the field of oceanography.

2. That this expansion of the national effort * * * be planned in general conformity with the NASCO recommendations as modified in the subcommittee's report.

3. That full advantage be taken of existing Federal programs which can support training, education, and basic research in oceanography.

4. That professional oceanographers and interested scientific and research institutions take vigorous action to recruit scientists and organize educational programs.

5. That the national program in oceanographic research and surveys be planned and conducted taking maximum advantage of the mutual benefits to be derived from international cooperation.

Concerning planning and coordination, the subcommittee went on to make the following specific recommendations:

1. That a permanent interagency committee be established by the Federal Council to implement, coordinate, and review a national program in oceanography.
2. That the Federal agencies concerned develop ten-year plans for expansion of their existing programs in oceanography consistent with the national objective.⁴

THE INTERAGENCY COMMITTEE ON OCEANOGRAPHY

In late 1959, the Federal Council for Science and Technology accepted and endorsed the recommendations of the Subcommittee on Oceanography. Oceanography was recognized as an important field requiring additional emphasis in the national interest. On January 22, 1960, the FCST established the Interagency Committee on Oceanography (ICO) as a permanent committee of the Council, charged to provide the essential direction and coordination of (a) Federal programs contributing toward the goal of a coherent national oceanographic program, and (b) the activities of Federal agencies having statutory authority to engage in some phase of oceanographic research. Thus the ICO assumed the role that had previously been carried informally by the Coordinating Committee on Oceanography (CCO). The CCO continued to serve as an informal medium of communication and in a staff capacity to the ICO. Significantly, however, representatives appointed to the ICO were at sufficiently high levels of responsibility so that decisions made by the group had a greater expectation of being implemented without the attenuating effect accompanying interagency decisions made at too low a level that fail to meet the approval or endorsement and support of individual agency heads.

On March 10, 1961, Dr. Jerome B. Wiesner, as FCST chairman, documented the mission and function of the ICO in a letter to then chairman James H. Wakelin, Jr. This restatement of the ICO charter follows:

THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY,

March 10, 1961.

HON. JAMES H. WAKELIN, JR.,
Assistant Secretary of the Navy for Research and Development,
Washington, D.C.

DEAR DR. WAKELIN: The President has determined to continue the Federal Council for Science and Technology and has asked me to serve as Chairman. Accordingly, I am writing to affirm the continuance of the Interagency Committee on Oceanography as a permanent Committee of the Council under section 4 of Executive Order 10807. I also would like to have you continue to serve as Chairman of the ICO and report its activities directly to the Federal Council for Science and Technology.

It shall be the mission of the Interagency Committee on Oceanography to develop, annually, a national oceanographic program, incorporating its best judgment as to balance and emphasis in terms of both long-range scientific needs and requirements of Government agencies by:

(a) Reviewing current activities and planned programs of individual agencies in the context of the Government's overall long-range effort.

(b) Engaging in coordinated budget planning so as to recommend level of funding required for each fiscal year.

⁴ U.S. Federal Council for Science and Technology. Interagency Committee on Oceanography. National Oceanographic Program. Fiscal Year 1967. Washington, U.S. Government Printing Office, 1966. pp. iii, iv. (ICO Pamphlet No. 24, March 1966).

(c) Considering special problems that may arise in implementing the national program and recommending solutions therefor.

The Committee should consider, in addition, any other matters it deems relevant and important in advancing oceanography in the national interest.

In carrying out these functions, it is suggested that the Committee make use, as it deems appropriate, of assistance and studies from organizations such as the informal Coordinating Committee on Oceanography and the Committee on Oceanography of the National Academy of Sciences. The operating procedures of the Committee shall be determined by the Committee itself in order to best meet the objectives stated above.

With regard to the national oceanographic program, it is suggested that the Committee submit to the Council, annually on August 1, a recommended program of oceanographic effort and on February 1, annually, an approved national oceanographic program, based on the President's budget, for transmittal to the Congress.

The Council joins me in extending its appreciation to you and the Inter-agency Committee on Oceanography for your past efforts in the formulation of a national program which has been well conceived and orderly expanded. We are confident that the future work of the Committee will continue in this productive manner.

Sincerely yours,

JEROME B. WIESNER,
Chairman.

MEMBERSHIP

The membership of the ICO included representatives from nine Federal departments and agencies rounding out an organization which could be said to have covered all of the sectors of the executive branch of the Government with direct interests in marine affairs. A list of member departments and participating agencies follows:

- Atomic Energy Commission;
 - Department of Commerce: Environmental Science Services Administration; Maritime Administration;
 - Department of Defense: Office of Naval Research; Naval Oceanographic Office; Bureau of Naval Weapons; Bureau of Ships; Bureau of Yards and Docks; Coastal Engineering Research Center (Army Corps of Engineers);
 - Department of Health, Education and Welfare: Public Health Service; Office of Education;
 - Department of the Interior: Bureau of Commercial Fisheries; Bureau of Sport Fisheries and Wildlife; Geological Survey; Bureau of Mines; Federal Water Pollution Control Administration;
 - Department of State;
 - Department of the Treasury: U.S. Coast Guard;
 - National Science Foundation;
 - Smithsonian Institution.
- Official observers included representatives from the following:
- Council of Economic Advisors;
 - Office of Science and Technology;
 - Bureau of the Budget;
 - National Academy of Engineering Committee on Ocean Engineering;

National Academy of Sciences Committee on Oceanography.

The ICO was chaired first by James H. Wakelin, Jr., Assistant Secretary of the Navy for Research and Development. Subsequently, Dr. Robert Morse was chairman during his term as Assistant Secretary. He was followed, in turn, by Dr. Robert A. Frosch, who also

held the Assistant Secretary post. Gordon Lill of the Office of Naval Research served as executive secretary from August 1960 to September 1960. Robert B. Abel of the Office of Naval Research served in the capacity of the committee's executive secretary from October 1960 to February 1967. He was followed in this post by Edwin B. Shykind, who served until the abolition of the committee by the Federal Council in July 1967.

FUNCTIONS AND ORGANIZATION

It was the mission of the Interagency Committee on Oceanography to develop, annually, a Federal oceanographic program incorporating its best judgment as to balance, scope, and relative emphasis in terms of both long-range scientific needs and requirements of Government agencies. This was accomplished by (a) categorizing the total Federal effort in terms of broad goals cutting across agency lines; (b) reviewing current activities of individual agencies in the context of the Government's overall long-range effort; (c) engaging in coordinated budget planning so as to recommend levels of funding required for each fiscal year; and (d) considering special problems that arose in implementing the national program and recommending solutions therefor.

Activities during the years of existence of the ICO were devoted primarily to the analysis for the first time of existing Federal programs relating to oceanography and to compilations of the budgets of the Federal agencies in a manner permitting consideration of the status of the field as a whole. ICO analyzed these programs and budgets on a functional as well as agency basis, taking into consideration oceanographic research, scientific programs, oceanographic surveys, the design and development of oceanographic instrumentation, the procurement of oceanographic vessels, and the construction of physical facilities.

Owing to the wide diversity of subject matter encompassed by the ICO it was found expeditious to execute the committee's mission via seven advisory panels in the functional areas of research, surveys, international programs, ship construction, instrumentation and facilities, manpower and training, and ocean engineering. Advisory panels were composed of representatives involved in the oceanographic programs of the member agencies. Organization of the ICO by advisory panels and statements of panel charters follow:

OCEAN ENGINEERING

Bureau of Weapons; Bureau of Yards and Docks; Naval Oceanographic Office; Atomic Energy Commission; Environmental Science Services Administration; Maritime Administration; Bureau of Commercial Fisheries; Bureau of Mines; National Science Foundation; Coast Guard; Coastal Engineering Research Center.

CHARTER

OCEAN ENGINEERING PANEL

The Interagency Committee on Oceanography, Panel on Ocean Engineering is established to:

1. Determine and evaluate the Federal oceanographic program and its content, as it is related to those aspects of marine technology useful in allowing men to live in, operate on and use the sea in the best national interests.

2. Collect and disseminate technical information about engineering aspects directed toward utilization of the oceans.

3. Initiate and coordinate studies of interest to the ICO in areas of marine engineering.

4. Advise the Interagency Committee on Oceanography as to the direction and action necessary to develop, for the national good, a coordinated and progressive plan for the exploration and exploitation of the oceans, stressing the use and potential of sound engineering practices.

5. Work in concert with existing ICO panels where mutually beneficial exchanges will enhance the present technologies necessary for the exploration and exploitation of the world oceans.

6. Determine the present and projected requirements for oceanographic knowledge to be applied to the solution of ocean engineering problems.

MANPOWER AND TRAINING

Office of Education; Office of Naval Research; Naval Oceanographic Office; National Science Foundation; Bureau of Commercial Fisheries; Environmental Science Services Administration; Atomic Energy Commission, observer; National Academy of Sciences Committee on Oceanography, observer.

CHARTER

MANPOWER AND TRAINING PANEL

The objectives of the Manpower and Training Panel are to identify those problem areas in manpower which are likely to impede the national oceanographic program and to propose programs to the ICO for the solution of such problems.

INTERNATIONAL PROGRAMS

Office of Naval Research; Environmental Science Services Administration; Bureau of Commercial Fisheries; State Department; National Academy of Sciences Committee on Oceanography, observer; Chief of Naval Operations; Office of the Assistant Secretary of the Navy (R. & D.); Smithsonian Institution; National Science Foundation.

CHARTER

INTERNATIONAL PROGRAMS PANEL

The purpose of this panel is twofold:

(1) To insure that U.S. participation in the Intergovernmental Oceanographic Commission and other international programs proceeds in an aggressive, judicious, and timely manner; and (2) that the panel provides a forum whereby the various U.S. activities in international programs have a common meeting point. This allows the ICO to be aware of all aspects of U.S. participation in international oceanographic programs.

RESEARCH

Office of Naval Research, Naval Oceanographic Office; Bureau of Commercial Fisheries; Environmental Science Services Administration; National Science Foundation; Atomic Energy Commission; Smithsonian Institution; National Academy of Sciences Committee on Oceanography, observer; Public Health Service; Federal Council for Science and Technology, observer; Office of Science and Technology, observer; Advanced Research Projects Agency/OSD, observer.

CHARTER

OCEANOGRAPHIC RESEARCH PANEL

The responsibilities of the Research Panel of the Interagency Committee on Oceanography are to become aware of the principal research activities of the participating agencies of the ICO; to provide for the free exchange of information concerning research programs of the agencies; to coordinate the presentation of the budgets of the various agencies in order to provide a broad research effort in line with the national objectives, and to develop special reports on the research plans and progress of the Federal Government in oceanographic research. The Research Panel should have representation from all agencies responsible for carrying on or supporting oceanographic research. The panel should be responsible for the production of special reports calling attention to the ICO to areas in oceanography which require special budget consideration. It should be the responsibility of the Research Panel to prepare draft material and to edit special reports in the areas of oceanic research. The panel should make recommendations to the Chairman of the ICO concerning the adequacy of the overall Federal program in oceanography and make recommendations concerning the assignment of research responsibilities among the agencies as required.

SURVEYS

Environmental Science Services Administration (ESSA); Naval Oceanographic Office; Chief of Naval Operations; Office of Naval Research; Bureau of Commercial Fisheries; Coast Guard; National Academy of Sciences Committee on Oceanography, observer; Maritime Administration, observer; Geological Survey, observer; National Science Foundation, observer; Smithsonian Institution, observer; National Oceanographic Data Center, observer.

CHARTER

OCEAN SURVEYS PANEL

It is the mission of the ICO Ocean Surveys Panel to:

1. Provide for coordination in the planning of all marine surveys by agencies of the Federal Government in order to prevent unintentional duplication of effort and to effect mutual cooperation where such cooperation benefits one or all of the agencies concerned.
2. Provide a mechanism whereby the nongovernmental scientific body can provide advice to and receive operational assistance from the Federal marine survey agencies.
3. Translate the general oceanwide survey recommendations of the National Academy of Sciences Committee on Oceanography (NASCO) into an operational plan and, insofar as is possible, provide for the implementation of the resultant program.
4. Annually prepare a summary, including proposed funding, of the Federal marine survey efforts for consideration by the full Interagency Committee on Oceanography. Such summary will include recommendations for meeting existing survey deficiencies.
5. When so requested by the ICO, evaluate specific survey proposals presented by Federal agencies or nongovernmental organizations and make recommendations to the ICO.
6. Prepare for use by the ICO material on the survey program as required for use by the Congress, the Federal Council for Science and Technology.

SHIPS

Chief of Naval Operations; Office of Naval Research; Naval Oceanographic Office; Bureau of Ships; Environmental Science Services Administration; Bureau of Commercial Fisheries; National Science Foundation; Coast Guard; National Academy of Sciences Committee on Oceanography, observer.

CHARTER

ICO SHIPS PANEL

As originally authorized by the Assistant Secretary of the Navy for Research and Development in June of 1960, a Ships Panel of the Interagency Committee on Oceanography (ICO) was established to undertake the following:

1. Review individual agency ship construction and conversion programs to determine what ships are required.
2. Comment on the characteristics and means for funding.
3. Recommend types of ships which may be standardized to reduce cost.
4. Recommend standardization of equipment and scientific instrumentation where feasible.
5. Recommend the sizes of ships for appropriate assignment to laboratories and programs.
6. Determine reasonable estimates of construction costs. Estimate operating costs under various types of operation, i.e., manning by MSTs, Navy crews, and civilian laboratories.

In addition to the above, the work of the Ships Panel has progressed to include the following:

1. Development of annual coordinated ICO ship construction program.
2. Annual preparation and publication of the ICO ship operating schedules.
3. Development of inputs to the annual Intergovernmental Oceanographic Commission (IOC) ship operating schedules.
4. Updating of reports on ships and related data including methods of designing and funding for new construction.
5. Continuing interchange of technical information on ships, equipment, and operations.

INSTRUMENTATION AND FACILITIES

Bureau of Commercial Fisheries; Office of Naval Research; Naval Oceanographic Office; Environmental Science Services Administration; Coast Guard; Atomic Energy Commission; National Science Foundation; National Academy of Sciences Committee on Oceanography, observer; Coastal Engineering Research Center; Smithsonian Institution; National Oceanographic Data Center; National Aeronautics and Space Administration, observer; Health Education, and Welfare.

CHARTER

PANEL ON INSTRUMENTATION, EQUIPMENT AND FACILITIES

The principal objectives of the panel on Instrumentation, Equipment, and Facilities are: (1) to give impetus to the development of instruments, equipment, and instrument systems for oceanographic research, engineering, and surveys, (2) to encourage cooperation and coordination in these areas by the entire oceanographic community, and (3) to coordinate the development of shoreside facilities. These objectives are to be achieved through: (1) the annual review required in the preparation of the national oceanographic program, (2) the briefing of the panel members by experts in different fields, (3) the work of special ad hoc working groups reporting to the panel on specific areas of interest, (4) the development of adequate information exchange systems, (5) the use of special working groups to prepare hard, governmentwide specifications and follow through on supervision of procurement, tests, evaluation, and subsequent development of new and existing devices, and (6) facilitate the formation of communication interfaces between oceanographers and the industries that supply them.

In its review of the national oceanographic program, the panel will recommend cooperative effort where the needs of several agencies overlap and will point out and recommend appropriate action to strengthen lagging areas and to close gaps in the spectrum of instruments which serve the national ocean science, survey, and engineering activities.

The preparation of the annual National Oceanographic Program (NOP) began about 16 months prior to the fiscal year in which it was to be implemented. It proceeded with, and was part of, the whole process by which the total executive budget was prepared for submission to the Congress. Highlights of the development of a National Oceanographic Program plan by the ICO are presented below.

Initially, oceanographic programs of the participating agencies, together with budget estimates, were submitted to ICO panels. These agency submissions, while independently prepared, were not without the coordinating influence of the ICO. Having participated in panel deliberations throughout the year, agencies were aware of the progress of current projects. They knew the priorities developed in the ICO and the prospective programs of other agencies. Additional influences brought to bear included the expressed interests of Congress, the progress of work at research and educational institutions, and the comments and advice of NASCO. Concomitant with this submission of respective oceanographic programs to the ICO, the agencies were also submitting to parent departments their total program requirements. In this submission, oceanography was but one of the many elements describing the total efforts of the participating agencies.

Following the screening, balancing, and refinement of agency program plans on a functional basis by advisory panels, the ICO consolidated the functional areas into the first draft of the recommended National Oceanographic Program. In this form, the NOP was submitted to the Director, Office of Science and Technology, for a run through the feedback loop labeled "Spring Preview." In this preview, the Office of Science and Technology and the Bureau of the Budget jointly reviewed the recommended programs from each of the FCST committees responsible for consideration of special areas of science. As a result of the Spring Preview, it was sometimes necessary for the science advisor to return the draft NOP to the ICO for rebalancing within fiscal limits which the administration believed could be supported.

Following the Spring Preview and any subsequent modification of the program, the ICO formally submitted its recommended NOP to the chairman of the FCST. The Director of the Office of Science and Technology then convened an independent ad hoc panel of nongovernmental consultants, scientists, and engineers to examine the NOP proposal and evaluate the program document for coherence, completeness, balance, and responsiveness to national needs. All aspects of the program preparation were explored by this ad hoc panel. Programs were analyzed for balance among the functional areas in the agencies, and the overall program was again considered for possible redundancies and scientific gaps. Newly proposed programs were screened in a manner similar to that performed by the ICO panels to determine their promise and priority. Older projects were analyzed to see whether recent progress warranted acceleration or whether there were stagnating efforts which should be terminated.

When this special evaluation was completed, it was presented to the assembled members of the FCST together with a formal briefing of the recommended NOP by the chairman of the ICO. The Council, in reviewing the recommendations of the ad hoc panel together with the ICO presentation, had the option of suggesting changes to the ICO.

Finally, the ICO, guided by the recommendations and modifications of the Federal Council and the comments of the special OST panel prepared the final copy of the NOP which, subsequent to Council endorsement and clearance either as proposed or amended, was issued by the President to the Speaker of the House of Representatives and the President of the Senate. The final NOP was forwarded to the individual agencies and departments as a recommended national program and budget in oceanography and as a guide in the preparation of departmental budget submissions. It was also made available to the Bureau of the Budget to serve as a guide in the development of the President's budget.

The Interagency Committee and its panel organization permitted a wide range of coordination within the Federal agencies directly concerned with the NOP as well as a high degree of communication and flexibility. While the ICO reviewed and endorsed, or recommended modification, of the agencies' programs, it did so with the separate missions of the member agencies in mind. The ICO possessed no authority to challenge the responsibilities of individual agencies, hence the national program as composed annually by the ICO had to first satisfy the statutory requirements of the individual agencies before it could depart therefrom in the interest of a unified effort.

ICO PUBLICATIONS

Over some six years of operation, the ICO was a prolific publisher of reports. From March 1961 to August 1967, its publications—referred to as "ICO Pamphlets"—numbered 27, including the annual statements of the National Oceanographic Program for each of fiscal years 1962 through 1967 inclusive. Other reports treated matters such as: oceanographic ship operating schedules; oceanographic research in the Federal Government; university curricula in oceanography; a national plan for ocean-wide surveys; career opportunities in oceanography; undersea vehicles for oceanography; scientific and technical personnel in oceanography; U.S. oceanic research in foreign waters; and bibliographies of marine sciences publications and reports.

A significant event was ICO's publication in June 1963 of a ten-year, long-range national oceanographic plan for the period 1963-72 (Oceanography, The Ten Years Ahead, ICO Pamphlet No. 10). Synthesized from ten-year plans prepared by each of the ICO member agencies, the report embodied for the first time a statement by the executive branch of a national goal in oceanography:

To comprehend the world ocean, its boundaries, its properties, and its processes, and to exploit this comprehension in the public interest, in enhancement of our security, our culture, our international posture, and our economic growth.⁵

The report listed the coordinated plans for the decade 1963-1972 of the Federal agencies conducting and sponsoring oceanographic research. Included were statements of research objectives and projections of the funds, facilities, and manpower needed for their accomplishment categorized by agency, by function, and by the following six subordinate goals:

⁵ U.S. Federal Council for Science and Technology. Interagency Committee on Oceanography. Oceanography, The Ten Years Ahead. Washington, U.S. Government Printing Office, 1963, p. 7. (ICO Pamphlet No. 10, June 1963).

1. strengthening basic science,
2. improving national defense,
3. managing resources in the world ocean,
4. managing resources in domestic waters,
5. protecting life and property,
6. ensuring the safety of operations at sea.

The report considered the balance between research and surveys, and between manpower, ship, and facility resources. The program plan analyzed the nature of the cooperation required among the Federal agencies drawing on or contributing to oceanographic research, and also analyzed the relation between Federal and non-Federal participation.

According to the report, the budget required for oceanographic programs, ships, instruments, and facilities to meet the aggregate national goals, taking into account availability of skilled manpower, was to have grown an average of 10 percent to 11 percent a year from a level of \$124 million in fiscal year 1963 to \$350 million in fiscal year 1972, for a total of about \$2.3 billion over the decade. Over 44 percent of the Federal budget would have gone to private laboratories as compared to 37 percent in 1963. The total ten-year budget was allocated among the various goals as follows:

About 57 percent would have supported basic research and served to strengthen basic science; 33 of this 57 percent would have contributed simultaneously to scientific development for other national goals as shown below.

About 35 percent would have supported defense. Some 20 percent supported Navy basic research already included above and 15 percent supported applied programs.

Some 19 percent of the effort would have gone to improving the capability to manage resources and control threats to health in the world ocean (11 percent basic included above, and 8 percent applied).

About 8 percent would have been applied toward the discovery and exploitation of resources on and under the outer continental shelf and protection of the health of the U.S. public from coastal pollution (2 percent basic included above and 6 percent applied).

Less than 2 percent would have been applied to protection of lives and property ashore and safety at sea.

About 12 percent would have provided oceanographic services such as nonmilitary ocean surveys, data processing and archiving, and instrumentation calibration and standardization.

The ICO stated in the forwarding memorandum that it hoped the plan would, in effect, provide a means by which Federal, academic, and industrial members of the oceanographic community could move ahead concertedly by providing a perspective from which their various programs could be viewed in relation to one another, and to the national goals they supported.

A list of ICO publications appears at the end of this appendix.

MARINE RESOURCES AND ENGINEERING DEVELOPMENT ACT OF 1966

For marine science affairs, the year 1966 was a significant turning point. In June 1966, declaring that the public interest required a clear statement of national determination to use the ocean and the Great

Lakes more effectively, the Congress created a mechanism by which Federal marine science programs would have greater priority and sharper direction. It passed the Marine Resources and Engineering Development Act of 1966 (Public Law 89-454) calling on the President to develop a comprehensive, long-range, coordinated national program in marine science. The act called for the President to be assisted in this effort by an interim, Cabinet-level, policy planning and coordinating National Council on Marine Resources and Engineering Development (Marine Sciences Council, MSC) chaired by the Vice President and composed of the following members:

Secretary of State,
 Secretary of the Navy,
 Secretary of the Interior,
 Secretary of Commerce,
 Chairman, Atomic Energy Commission,
 Director, National Science Foundation,
 Secretary of Health, Education and Welfare,

Secretary of Transportation (Secretary of Transportation replaced Secretary of the Treasury with transfer of Coast Guard to DOT in accordance with Public Law 89-670).

Represented as observers were the following departments and agencies:

Administrator, National Aeronautics and Space Administration,
 Secretary, Smithsonian Institution,
 Administrator, Agency for International Development,
 Director, Office of Management and Budget,
 Chairman, Council of Economic Advisors,
 Director, Office of Science and Technology,
 Chairman, Council on Environmental Quality (added in 1970),
 Administrator, Environmental Protection Agency (added in 1970).

The act also provided for a citizens advisory Commission on Marine Science, Engineering, and Resources. Appointed by the President, it was composed of 15 members selected from Federal and State Governments, industry, and universities and, in addition, four advisory members from the Congress. The Commission was explicitly enjoined to submit a report to the President and the Congress—via the Council—that would include recommendations on national marine science programs and a governmental organization plan.⁶

The act declared it to be the policy of the United States to:

* * * develop, encourage and maintain a coordinated, comprehensive, and long-range national program in marine science for the benefit of mankind to assist in protection of health and property, enhancement of commerce, transportation, and national security, rehabilitation of our commercial fisheries, and increased utilization of these and other resources.

The act thus served as a foundation and set the stage for a concerted effort to identify national marine goals, develop the means for reaching them, and coordinate and encourage marine science activities of the Federal Government.

⁶ See: U.S. Commission on Marine Science, Engineering, and Resources. *Our Nation and the Sea*. Washington, U.S. Government Printing Office, January 1969. 305 pp., 3 v. (various pagings).

The principal responsibility of the Marine Sciences Council was to assist the President in planning and reviewing Federal marine science activities. The President, with the advice and assistance of the Marine Sciences Council, was specifically directed to:

Survey all significant marine science activities;

Develop a comprehensive program of marine science activities * * * to be conducted by departments * * * independently or in cooperation with such non-Federal organizations as States, institutions and industry;

Designate and fix responsibility for the conduct of the foregoing marine science activities by departments and agencies * * *;

Ensure cooperation and resolve differences arising among departments and agencies * * *;

Undertake a comprehensive study * * * of the legal problems arising out of the management, use, development, recovery, and control of the resources of the marine environment;

Establish long-range studies of the potential benefits to the U.S. economy, security, health, and welfare to be gained from marine resources, engineering, and science, and the costs involved in obtaining such benefits; and

Review annually all marine science activities conducted by departments and agencies * * *.

As for the relation between the Marine Sciences Council and the ICO, where the potential existed for substantial duplication of effort and possible conflict of proposed programs, Vice President Humphrey, in opening the first meeting of the Council on August 17, 1966, distinguished the ICO from the Marine Sciences Council saying that the former would be concerned with program coordination in oceanography, while the latter would be concerned with policy coordination. The MSC, however, would take over the function of advice and assistance to the President in the annual review of Federal oceanographic programs and steps to coordinate such activities.⁷

Agreement was reached between Vice President Humphrey, Chairman of the MSC, and Dr. Donald F. Hornig, Chairman of the FCST, for the ICO to provide staff functions for the Marine Sciences Council. Assistance and support provided by the ICO was to have involved mainly the review and development of Federal programs, and the compilation and dissemination of information about the many detailed aspects of the various agency programs. In essence, the ICO would be the essential mechanism for publishing the annual report—a responsibility reassigned from the ICO to the MSC by the new law.⁸

Later on that same year, Vice President Humphrey indicated an interim transfer of the ICO's orientation to the Marine Sciences Council. He wrote:

We feel that the Interagency Committee on Oceanography can continue to play a very important role in supporting many activities, and steps were taken early in September [1966] to continue this organization, with an interim transfer of its orientation to this Council rather than the Federal Council for Science and Technology.⁹

⁷ U.S. Congress, House, Committee on Government Operations, Subcommittee on Military Operations, The Office of Science and Technology, Report prepared by the Science Policy Research Division, Legislative Reference Service, Library of Congress. (Committee Print, 90th Congress, 1st session), March 1967. Washington, U.S. Government Printing Office, 1967, p. 120.

⁸ U.S. Federal Council for Science and Technology, Activities of the Federal Council for Science and Technology, Report for 1965 and 1966. Washington, Office of Science and Technology, 1967, p. 23.

⁹ Humphrey, Hubert H. "Opportunity to Move Ahead." *Undersea Technology*, v. 8, Jan. 1967: 25.

In view of the fact that, for all practical intents and purposes, the ICO was in essence reporting to the Marine Sciences Council, the FCST abolished the Interagency Committee on Oceanography in 1967. In its 1967 annual activities report, the Federal Council stated:

The Interagency Committee on Oceanography was abolished because responsibility for coordinating Federal oceanographic activities was vested in a new entity created by statute—the National Council on Marine Resources and Engineering Development. Since the Marine Council has a limited life, the way was left open to transfer the coordinating responsibility as might be indicated as a result of the studies and recommendations of the Marine Council and the Commission on Marine Science, Engineering and Resources.¹⁰

By direction of the Vice President, with agreement of the President's Science Advisor, the Interagency Committee on Oceanography was formally reconstituted on the 13th of July, 1967, and replaced by a set of standing committees of the Marine Sciences Council. One of these dealt with the activities that the ICO had engaged in most of its lifetime: marine research, education, and facilities. The Committee on Marine Research, Education, and Facilities was chaired by Robert Frosch, immediate past chairman of the ICO. The other standing committees established were: Committee on International Policy in the Marine Sciences; Committee on Ocean Exploration and Environmental Services; Committee on Multiple Uses of the Coastal Zone; and Committee on Food from the Sea.

The activities of the Marine Sciences Council and its working committees are documented in the Council's annual reports for the years 1967 to 1971 inclusive. These reports, required by the Marine Resources Act to be transmitted annually by the President to the Congress, detailed the state of the Nation's marine science programs; described the activities and accomplishments of the Federal departments and agencies active in marine science and marine affairs; evaluated these accomplishments; and set forth recommendations as to future policies, programs, and funding consistent with the objectives as stated in the basic act.

The lifetime of the Marine Sciences Council expired statutorily on June 30, 1971. The Council published its last annual report to the President and Congress in April 1971. In March 1971, an Interagency Committee on Marine Science and Engineering (ICMSE) was established by the Federal Council for Science and Technology to replace the Marine Sciences Council. It was given less responsibility, but a similar function of coordinating agency activities in the marine sciences. ICMSE prepares an annual report to the President and the Congress as did the Marine Sciences Council and the ICO before that.

¹⁰ U.S. Federal Council for Science and Technology. Federal Council for Science and Technology, 1967 Annual Report. Washington, Office of Science and Technology, 1968, p. 2.

ICO Publications

No.

1	Oceanographic Ship Operating Schedule, Fiscal Year 1962 -----	March, 1961.
2	National Oceanographic Program, Fiscal Year 1962-----	March, 1961.
3	National Oceanographic Program, Fiscal Year 1963-----	May, 1962.
4	Oceanographic Ship Operating Schedule, Fiscal Year 1963 -----	May, 1962.
5	Oceanographic Research in the Federal Government-----	June, 1962.
6	University Curricula in Oceanography 1962-63-----	June, 1962.
7	National Plan for Ocean-Wide Surveys-----	May, 1963.
8	Opportunities in Oceanography-----	July, 1964.
9	Bibliography of Oceanographic Publications-----	April, 1963.
10	Long Range National Oceanographic Plan 1963-72-----	June, 1963.
11	National Oceanographic Program, Fiscal Year 1964-----	April, 1963.
12	Oceanographic Ship Operating Schedule, Fiscal Year 1964 -----	May, 1963.
13	Canceled-----	-----
14	University Curricula in Oceanography 1963-64-----	June, 1963.
15	National Oceanographic Program, Fiscal Year 1965-----	March, 1964.
16	Oceanographic Ship Operating Schedule, Fiscal Year 1965 -----	May, 1964.
17	National Oceanographic Program, Fiscal Year 1966-----	January, 1965.
18	Underseas Vehicles for Oceanography-----	December, 1965.
19	Oceanographic Research in the Federal Government-----	September, 1966.
20	Bibliography of Marine Sciences Publications and Reports (1962-64)-----	September, 1966.
21	Scientific and Technical Personnel in Oceanography in the United States-----	November, 1965.
22	Oceanographic Ship Operating Schedule, Fiscal Year 1966 -----	May, 1965.
23	University Curricula in Oceanography Academic Year 1965-66 -----	December, 1965.
24	National Oceanography Program, Fiscal Year 1967-----	March, 1966.
25	U.S. Oceanic Research in Foreign Waters-----	January, 1966.
26	Canceled -----	-----
27	Oceanographic Ship Operating Schedule, Fiscal Year 1967 -----	July, 1966.
28	Canceled -----	-----
29	Canceled -----	-----
30	University Curricula in the Marine Sciences, Academic Year 1967-68-----	August, 1967.
31	Oceanographic Ship Operating Schedule, Fiscal Year 1968 -----	July, 1967.

APPENDIX N

THE INTERAGENCY COMMITTEE ON MARINE SCIENCE AND ENGINEERING:
A CASE HISTORY

PREPARED BY ROBERT E. MORRISON

SPECIALIST IN EARTH SCIENCES
SCIENCE POLICY RESEARCH DIVISION
CONGRESSIONAL RESEARCH SERVICE

THE INTERAGENCY COMMITTEE ON MARINE SCIENCE AND ENGINEERING

ESTABLISHMENT AND PURPOSE

The Interagency Committee on Marine Science and Engineering (ICMSE), one of the standing committees of the Federal Council for Science and Technology (FCST), provides an interagency mechanism for the planning and coordination of Federal activities in the marine sciences and engineering and in related matters. In 1971 the Council established the ICMSE, whose concern encompasses all Federal scientific and engineering initiatives and programs related to the marine environment.¹ The stated purpose of the Committee includes identification of the needs for and fostering of studies or investigations on marine subjects deemed appropriate and the annual review of the Federal marine science and engineering program and budget.² A principal function of the Committee is that of assistance to the FCST in preparation of an annual report for transmittal by the President to Congress.³

The ICMSE holds regular meetings every other month; however, special sessions have been called on occasion. Such meetings can be held at the call of the Chairman or at the request of any member or members. Each regular meeting is preceded by a meeting of a Staff Preparatory Group, which develops the agenda for the Committee. The Preparatory Group is comprised of staff representatives from the ICMSE member agencies and is chaired by the Executive Secretary of the ICMSE.

MEMBERSHIP

Each Federal agency with a program in the marine area has membership on the ICMSE, and a number of Federal organizations participate through official observers. Following is a list of the twelve member agencies:

Department of Commerce,
Army Corps of Engineers,
Department of the Navy,

¹ Many of the functions of the present Interagency Committee on Marine Science and Engineering (ICMSE) were carried on previously by the Interagency Committee on Oceanography (ICO), another FCST committee, which was formed in 1959 and later abolished in 1967, when responsibility for coordinating Federal ocean activities was vested in the National Council on Marine Resources and Engineering Development (NCMRED). The latter was established within the Executive Office of the President with enactment of the Marine Resources and Engineering Development Act (Public Law 89-454) in June 1966. The law limited the life of the NCMRED, however, and it discontinued operations in April 1971. The FCST established ICMSE in April 1971 in recognition of a continuing need for an interagency mechanism for coordinating marine activities, provided earlier by ICO and NCMRED.

² Executive Office of the President. Office of Science and Technology. The Federal Ocean Program; The Annual Report of the President to the Congress on the Nation's Efforts to Comprehend, Conserve, and Use the Sea. Washington, U.S. Government Printing Office, April 1972. Appendix D, p. 116.

³ The annual report on the Federal Ocean Program is prepared in accordance with Public Law 89-454, the Marine Resources and Engineering Development Act of 1966.

Department of Health, Education, and Welfare,
 Department of the Interior,
 Department of State,
 Department of Transportation,
 Energy Research and Development Administration,⁴
 Environmental Protection Agency,
 National Aeronautics and Space Administration,
 National Science Foundation,
 Smithsonian Institution.

Official ICMSE Observers include representatives from the following agencies and committees:

Agency for International Development,
 Committee on International Environmental Affairs,
 Committee on Water Resources Research,
 Council on Environmental Quality,
 Domestic Council,
 Federal Council for Science and Technology,
 Interagency Arctic Research Coordinating Committee,
 Interagency Committee for Marine Environmental Prediction,
 Interdepartmental Committee for Atmospheric Sciences,
 National Advisory Committee on Oceans and Atmosphere,
 Office of Management and Budget.

The Chairman of the ICMSE is Dr. Robert M. White, Administrator of the National Oceanic and Atmospheric Administration (NOAA), and the Executive Secretary is Mr. Steven N. Anastasion of NOAA's Office of Marine Resources. Both have served in their respective positions since the formation of the Committee in 1971.

ICMSE SUBCOMMITTEES

To carry out its responsibilities, the ICMSE has established a number of subcommittees to handle special aspects of marine science and engineering activity. There are currently four such standing subcommittees. Each of these is listed below, along with identification of the agency providing the chairmanship and a brief statement of purpose:⁵

Chesapeake Bay Subcommittee (chaired by the Army Corps of Engineers). Purpose is to provide the ICMSE with its principal means for reviewing National needs and planning and coordinating Federal programs in the Chesapeake Bay.

Subcommittee on Marine Pollution Abatement and Control (Chaired by the Department of Transportation). Purpose is to provide the ICMSE with its principal means for the coordination of Federal activities in the area of marine pollution abatement and control through:

1. Review of National needs in marine pollution abatement and control.
2. Review and coordination of Federal agency pollution abatement and control science and engineering effects, both current

⁴ Prior to the establishment of the Energy Research and Development Administration by Public Law 93-438, the Energy Reorganization Act of 1974, the Atomic Energy Commission was a member agency of the ICMSE.

⁵ Information on subcommittees was obtained from unpublished subcommittee charters, provided by the ICMSE Staff.

and proposed, to ensure that (a) they are directed toward common goals and (b) no serious gaps or unnecessary redundancies exist.

3. Recommending research and development objectives and goals in marine pollution abatement and control.

Subcommittee on Mapping and Charting the Oceans (chaired by the Department of Commerce). Purpose is to provide for ICMSE the principal mechanism to meet its responsibilities for the coordination of civilian marine mapping and charting. It reviews annually Federally-sponsored marine mapping and charting and related research activities and provides advice to ICMSE regarding the efficient collection and use of bathymetric, geophysical, and geological marine data.

Subcommittee on Ships (Chaired by the National Science Foundation). Purpose is to provide a mechanism for ICMSE to exchange information among member agencies pertaining to:

1. Annual ship costs and problems
2. Ship lay-ups
3. Ship construction plans.

and provides an input to the annual Federal Ocean Program report and reports regularly to the ICMSE items of critical concern.

At a recent meeting, the ICMSE established a new Subcommittee on Aquaculture, which is now being formed and whose chairman will be provided by the Department of Commerce. Until recently there was also a standing Subcommittee on Coastal Zone Research and Engineering. It was abolished by the ICMSE in January 1976, however, since the scope of activities under its purview was considered to be too large for a single subcommittee.

Following the formation of the Senate's National Ocean Policy Study (NOPS),⁶ and at the request of the Secretary of Commerce, ICMSE established a Select Committee on Ocean Policy Study (SCOPS), which operates as a Committee of the Whole, in order to respond to questions and issues raised by the NOPS and to undertake studies and prepare reports when requested. The ICMSE Chairman, Dr. Robert M. White, also serves as Chairman of the SCOPS, and Dr. Clare P. Idyll, also of NOAA, is its Study Director.

In addition to its standing subcommittees and SCOPS, the ICMSE has on occasion established ad hoc groups to study special problems such as the development of interagency policy on data management, Federal research programs in marine environmental quality, and Federal response to natural marine disasters.

COORDINATION WITH OTHER COMMITTEES

To fulfill its role in coordinating Federal activities in ocean science and engineering, the ICMSE remains in close contact with other Federal and quasi-Federal committees. In addition to those committees listed above who provide official observers to ICMSE, close coordination is maintained with the following:

- National Academy of Engineering—Marine Board.
- National Academy of Sciences—Ocean Affairs Board.
- National Oceanographic Data Center Advisory Board.
- National Oceanographic Instrumentation Center Interagency Committee,

⁶ The National Ocean Policy Study (NOPS) was initiated by the Senate Commerce Committee in 1974, following adoption of S. Res. 222 on February 19, 1974.

Panel on International Programs and International Cooperation in Ocean Affairs,

University—National Oceanographic Laboratory System Advisory Council.

ICMSE ACTIVITIES

The ICMSE has been concerned with a wide variety of subjects over its five years of existence. In a number of these subject areas the Committee has made recommendations to the FCST or has proposed action by the member agencies to resolve marine program issues. Occasionally, *ad hoc* groups have been established to study special problems. Specific problem areas have also been considered through major conferences, bringing together Federal field and headquarters level planners and program directors.

ANNUAL REPORT

The Marine Resources and Engineering Development Act of 1966, Public Law 89-454, states that the President shall transmit to the Congress an annual report which includes: (a) a comprehensive description of the activities and the accomplishments of all the agencies and departments of the United States in the field of marine science during the preceeding fiscal year; (b) an evaluation of such activities in terms of the objectives set forth pursuant to Public Law 89-454; (c) such recommendations for legislation as the President may consider necessary or desirable for the attainment of the objectives of Public Law 89-454; and (d) an estimate of funding requirements of each agency and department of the Federal Government for marine science activities during the succeeding year.⁷ Accordingly, the report, designated The Federal Ocean Program, has been prepared annually by the FCST, initially under the Office of Science and Technology and more recently under the Science and Technology Policy Office of the National Science Foundation (NSF).⁸ After submission to the President, the annual report is transmitted by him to the Congress, as required by Public Law 89-454.

A major activity of the ICMSE each year is the gathering of information and the analysis of agency programs on marine science for the annual report. The ICMSE further provides assistance to the FCST in the preparation and agency review of the report.

EARLY PROGRAM REVIEWS AND RECOMMENDATIONS

Two major marine science and engineering program reviews were conducted by ICMSE in the fall of 1971 and 1972.⁹ The objectives were to exchange information on common program areas and examine agency planning in order to insure program coordination and reduce unnecessary duplication and to make recommendations on issues

⁷ National Science Foundation. Science and Technology Policy Office. The Federal Ocean Program: The Annual Report of the President to the Congress on the Nation's Efforts to Comprehend, Conserve, and Use the Sea. Washington, U.S. Government Printing Office, April 1974, p. v.

⁸ The first three editions of The Federal Ocean Program have been published in April of the years 1972 through 1974. The report dated April 1975 was in the final review process as of the date of this report, and the 1976 report was in preparation.

⁹ Information on these program reviews was obtained through informal discussions with the ICMSE staff and from unpublished materials.

raised during the reviews. The reviews were structured in accordance with major functional marine areas or programs specially highlighted in view of national needs. Rather than having an agency-by-agency program briefing, the reviews consisted of integrated presentations by single spokesmen for each of the functional areas considered.

The following recommendations on problem areas in the Federal ocean program were provided to the FCST by the ICMSE after the first program review, held September 14-15, 1971:

1. *Marine environmental quality.*—The ICMSE recognized the need for national goals and priorities in marine environmental quality and for further review and coordination of agency programs in this area. It committed itself to improving mechanisms for coordinating the planning and conduct of agency programs in marine quality, recommending, meanwhile, the proceeding with current programs and the approval of budgets submitted for fiscal year 1973.

2. *Geological and geophysical mapping in support of nonliving resource development.*—The ICMSE recognized the need to determine the adequacy of Federal programs for providing marine geological and geophysical data required for development and management of nonliving resources of the seabed. It recommended that the Federal Coordinator for Ocean Mapping and Prediction (who reports to the Administrator of NOAA) be asked to analyze the need for further program coordination in these areas and to recommend priorities on programs needing coordination.

3. *Multipurpose charting.*—The ICMSE recognized that decisions on coastal jurisdictions and consequent resource development and management in these regions have been delayed because of the lack of a precise definition of the mean low waterline along the U.S. coastline. It also recognized the continuing need for coastal zone mapping products for managing activities in that zone and for navigation by ships and small craft. The Committee recommended that seaward boundary and coastal mapping and charting be given high priority and that the Federal Coordinator for Ocean Mapping and Prediction be asked to review programs in this area and recommend coordination where necessary.

4. *Impact of the loss of funds for oceanographic ship operations.*—Noting the reduced Navy funding for ship support in academic and institutional programs, the attempt by the NSF to partially fill gaps left by loss of Navy support, and the reduction of in-house ship support in NOAA, the ICMSE recognized a probable net reduction of total ship time for oceanographic programs. The Committee agreed to examine the impact of reduced ship time on priority programs, taking into account alternate means of ocean data acquisition (e.g., satellites, data buoys, and other instrumentation), and to provide recommendations on long-term needs for oceanographic ships.

5. *Deep water ports.*—The ICMSE noted worldwide trends in construction of deep draft vessels and the concern over lack of sufficient U.S. deep water ports to accommodate increased use of ships with large deep draft hulls, resulting in possible loss of foreign trade. The Committee encouraged continued efforts by the Maritime Administration and the Army Corps of Engineers in investigating this problem and committed itself to a review of problems and potentials of deep water ports and offshore terminals at a future ICMSE meeting.

6. *Reassessment of national priorities in marine science and engineering.*—The ICMSE examined the question of need for justification and for identification of long-term objectives and priorities in the Nation's ocean program. Noting the recent organization of the National Advisory Committee on Oceans and Atmosphere (NACOA) and its likely early review of ocean programs in light of national needs, the Committee recommended that NACOA use the Stratton Commission report as a starting point in its evaluation of National programs in meeting long-term objectives.

7. *Freedom of scientific research.*—The ICMSE recognized the need to adopt a position which strongly supports freedom of scientific research in the ocean. It recommended that high priority be given to maintaining maximum flexibility in ocean research in any U.S. position regarding the law of the sea.

After the second major program review, conducted October 19–20, 1972, the recommendations summarized below were submitted to the FCST:

1. *Prediction and management of living resources.*—The ICMSE recognized a need for improved size predictions and harvest controls for living marine resources. It recommended increased efforts to achieve these improvements, to enhance understanding of organic processes, to support international negotiations, and to increase fisheries through attention to under-utilized species.

2. *Federal response to natural marine disasters.*—The ICMSE noted the inadequacy of Federal mechanisms to respond to natural marine disasters, demonstrated especially by the situation in Chesapeake Bay following tropical storm Agnes, and recognized the need to improve research and survey requirements to assess the impact of such disasters on the marine environment. The Committee recommended that NOAA lead a case study analysis of the Federal response to Agnes, in order to evaluate current Federal authorities and limitations and to propose modifications for improvement of the Federal response.

3. *Developing the off-shore petroleum potential.*—ICMSE noted the increasing demand for energy resources and the inadequacy of marine programs required to develop the full potential of the off-shore sources. It recommended adequate funding of agency programs designed to achieve development of offshore oil resources; these programs included reconnaissance mapping, resource assessment, and studies to provide environmental standards for operations.

4. *Sea grant program.*—The ICMSE considered the Sea Grant Program to be an important segment of the Federal ocean program. It endorsed the continuing development of the Program and recommended that the Office of Sea Grant examine its arrangements with technical information services to insure that its publications are available to all potential users.

5. *Adequacy of resources to support international programs.*—The ICMSE noted that Federal agencies have been assigned lead agency roles in international bilateral marine science programs without provision of adequate resources for these added responsibilities. The Committee recommended that this problem be brought to the attention of the Office of Science and Technology and that adequate authority and resources be granted in such cases.

6. *National data buoy system logistics.*—Noting that an operational network of data buoys should be possible off U.S. coasts by 1978–80, the ICMSE recognized the urgent need for an adequate logistic system for buoy deployment and maintenance. It recommended that the Coast Guard, assisted by NOAA, review planned buoy development and deployments in order to insure that Coast Guard programs for buoy logistics will be adequate.

7. *Coordination of Federally-sponsored research at academic institutions.*—The ICMSE noted no major problems in the coordination of Federally-sponsored marine research at academic institutions but recognized a need to strengthen such coordination in view of continuous increase in the number and variety of institutional projects. The Committee recommended that agencies supporting research programs at such institutions exchange information on program managers, program summaries, and plans for site visits, extending invitations for participation by other agencies in such visits.

8. *Support of coastal research craft.*—The ICMSE recognized the inadequacy of support levels to meet expanding requirements for small research craft for the coastal zone and the Great Lakes. It recommended that agencies, especially NOAA and EPA, consider the recommendations of the University-National Oceanographic Laboratory System (UNOLS) in future programs, providing support for such craft in accordance with expanding coastal zone research requirements.

9. *Utilization of manned undersea submersibles and habitats.*—In view of statistics on submersibles produced and their utilization, the ICMSE recognized the need of the Federal Government to assess requirements for submersibles and manned undersea habitats for marine research. It recommended that NOAA, through its Manned Undersea Science and Technology Office, provide such assessment on a continuing basis and coordinate the use of available assets by civilian Federal agencies.

Since these first two extensive program reviews, in 1971 and 1972, the ICMSE has maintained a continuing review of the Federal ocean program. It has not, therefore, considered such major reviews to be necessary on an annual basis.

GREAT LAKES CONFERENCES

The ICMSE has sponsored two conferences on Federal research programs in the Great Lakes area. The First Federal Conference on the Great Lakes, hosted by the Environmental Protection Agency (EPA), was conducted in December 1972, when field and headquarters program directors met to discuss Federal programs in marine science and engineering affecting the Great Lakes and to coordinate Federal activities in that region. ICMSE member agencies were joined in the Conference by representatives from the Department of Agriculture, the Great Lakes Basin Commission, the Council on Environmental Quality, the General Accounting Office, the International Joint Commission, the Great Lakes Fisheries Commission, and the International Association of Great Lakes Research. The conference proceedings were prepared for the ICMSE by the Environmental Protection Agency.¹⁰

¹⁰ Federal Council for Science and Technology, Interagency Committee on Marine Science and Engineering, Proceedings of the First Federal Conference on the Great Lakes (December 13, 14, 15, 1972). Prepared by the Environmental Protection Agency, Corvallis, Oregon (no date given for proceedings). 324 p.

A second ICMSE conference on the Great Lakes was held in March 1975 and was hosted by the Energy Research and Development Administration (ERDA). The theme of the second conference was research related to assessment of the environmental impact of energy utilization in the Great Lakes Basin. Proceedings of the conference are in preparation by ERDA.

MAPPING AND CHARTING

In 1973 the Office of Management and Budget (OMB) Federal Mapping Task Force prepared a report on civilian mapping and charting activities in the Federal Government, in which recommendations were directed to the ICMSE.¹¹ The Committee had been concerned with these activities since its inception but had deferred any coordinating action at the request of the OMB until completion of the Task Force study. The ICMSE reviewed the completed OMB study and responded to OMB on its recommendations through the Chairman of the FCST.

Subsequently, the ICMSE Subcommittee on Mapping and Charting was established to provide continuing overview and coordination of these activities among Federal agencies. A published report to the parent committee on new mapping, charting, and geodesy products available in 1974 was prepared by the subcommittee.¹²

OCEAN SCIENCE CAPITAL ASSETS

A major project of the ICMSE has been a continuing review of the situation regarding the scheduling, utilization, and replacement of oceanographic research ships. This review has been in the context of current problems associated with rising fuel costs and other operating expenses during a period of budget constraints. The retirement of a number of such ships, coupled with projected increases in ship requirements and inadequate replacement in number and kind, foretells a possible long-term crisis if alternatives are not found.

With respect to the Federal and Federally-sponsored fleet of ships, the ICMSE established the permanent Subcommittee on Ships to provide continuing overview in this critical area. Current ICMSE projects include investigations of oceanographic ship utilization and the status of ship construction and replacement.

ICMSE has assigned to NOAA the centralized responsibility for assessing civilian agency needs for submersible habitats and the coordination of use by these agencies of available commercial and Navy assets. Currently underway is an inquiry on aircraft capital assets available to the U.S. ocean program.

In its second annual report, the National Advisory Council on Oceans and Atmosphere (NACOA) expressed concern with the deteriorating capital structure supporting U.S. marine science and engineering activities.¹³ At the request of the Chairman of the FCST,

¹¹ Office of Management and Budget, Federal Mapping Task Force, Report of the Federal Mapping Task Force on Mapping, Charting, Geodesy, Surveying, Washington, U.S. Government Printing Office, July 1973, 198 p.

¹² Federal Council for Science and Technology, Interagency Committee on Marine Science and Engineering, Mapping, Charting, and Geodesy; New Products; 1974, Washington, November 20, 1975, 29 p.

¹³ National Advisory Committee on Oceans and Atmosphere, A Report to the President and the Congress, Second Annual Report, Washington, U.S. Government Printing Office, June 29, 1973, p. 3.

the ICMSE initiated a major study of this problem. Funded by Navy, NOAA, and the National Science Foundation (NSF), the study was performed under contract by the Center for Naval Analyses (CNA) and was completed in 1975.¹⁴ The ICMSE reviewed the completed CNA report and provided further analysis and recommendations before forwarding the result to the Chairman of the FCST.¹⁵ The report was ultimately transmitted by the FCST to the Secretary of Commerce for consideration by NACOA.

Significant findings of the study on marine science capital structure are summarized below:¹⁶

1. There are significant shortfalls in available ship days-at-sea under several different assumptions about future inventories and requirements.

2. Ship utilization can be increased by spending more on ship operating costs.

3. There is a shortfall of aircraft, suggesting underinvestment. However, the shortfall itself and, hence, costs to meet it are heavily influenced by the availability of aircraft not paid for out of ocean science funds.

4. Data on submersibles/habitats and computers is weak. At most, the data supports a finding of modest shortfalls which are growing slightly in fiscal years 1975-79.

Based on findings by the CNA study and its own analysis, the ICMSE provided the following recommendations on capital facilities for a sound national ocean program:¹⁷

1. A national policy decision not to allow the capital facilities to continue to degrade;

2. A concomitant commitment to provide necessary operating and capital funds to meet reasonable ocean facility needs. ICMSE estimated that increased operating and capital funding on the order of \$35 million per year for the next decade will be required to remedy the ship situation. Specifically, ICMSE suggested that priority be given:

- (a) To achieving optimum utilization of existing ships.

- (b) To initiating a fleet replacement construction program, and

- (c) To increasing the number of small-size vessels to meet the growing requirements for coastal water investigations;

3. A continuing assessment of ship construction needs for both replacements and additions to the capital structure inventory based on forecasts of program requirements;

4. An improvement of ship utilization data, with emphasis on parameters of optimum use and comparability of utilization measures among agencies;

5. Continued efforts to assess the Federal-civilian agency needs for submersibles and habitats and to coordinate the utilization of available commercial and Navy assets by those agencies; and

¹⁴ Robert F. Hale (study director), *The Capital Structure for Ocean Science: Final Report of the Ocean Science and Technology Resources Study*, Center for Naval Analyses, CNS 1048, Arlington, Va., March 1975, 77 p. (Authors are Robert F. Hale, Anne S. Jondrow, James E. Koehr, Susan E. Bender, and Richard A. Kuznack.)

¹⁵ Federal Council for Science and Technology, *Interagency Committee for Marine Science and Engineering, The Capital Structure for Ocean Science*, 1975, Washington, April 17, 1975, 89 p. (Includes as Appendix B the Center for Naval Analyses report on same subject.)

¹⁶ *Ibid.*, p. 3.

¹⁷ *Ibid.*, pp. 6-7.

6. A detailed review of the aircraft requirements for marine programs.

SELECT COMMITTEE ON OCEAN POLICY STUDY

During 1974 the Senate established the National Ocean Policy Study (NOPS).¹⁸ In support of NOPS, at the request of Secretary of Commerce Frederick B. Dent, the ICMSE shifted some of its emphasis in order to provide a broad interagency response to questions and issues raised by the Senate Study staff. To do so, the ICMSE established a committee of the whole, known as the Select Committee on Ocean Policy Study (SCOPS). In doing so the committee undertook to provide such response not only in matters of science and technology covered in its Terms of Reference,¹⁹ but in all matters relating to ocean policy and ocean activity within the capability of its members.

A number of requests received from the NOPS have prompted the undertaking of studies by the SCOPS. The first two such requests were for studies on ocean data resources in the United States and on ocean instrumentation. From these studies the ICMSE produced two reports, one published by the NOPS²⁰ and the other by the Federal Council.²¹

In subsequent requests, the ICMSE, through its SCOPS, assisted the General Accounting Office (GAO) in the preparation of one report for NOPS²² and provided comments on another report by the GAO for NOPS.²³

In response to another request from NOPS a study on Federal programs in the Great Lakes area was undertaken by the ICMSE. This study culminated in a comprehensive report on research, development, and management of Federal water-related programs in the Great Lakes region, which was published in October 1975.²⁴

In another study currently underway, the ICMSE, through its SCOPS, is examining authorities of Federal agencies in geographic areas encompassed by recent extensions of jurisdictions at sea. It is likely that this study will also produce a report for the NOPS.

OTHER RECENT ICMSE ACTIVITIES

A number of other issues have been examined by the ICMSE over its five-year lifetime. The following list indicates the variety of such activities which have been completed or are currently underway in addition to those discussed in more detail in the preceding sections:

¹⁸ This followed adoption of S. Res. 222 on February 19, 1974.

¹⁹ Executive Office of the President, Office of Science and Technology, *The Federal Ocean Program*. Washington, U.S. Government Printing Office, April 1972, Appendix D, p. 116.

²⁰ U.S. Congress, Senate, Committee on Commerce, *National Ocean Policy Study, Ocean Data Resources*. (Committee Print) Washington, U.S. Government Printing Office, March 1975, 60 p.

²¹ Federal Council for Science and Technology, Interagency Committee on Marine Science and Engineering, *Ocean Instrumentation*. Prepared by the National Oceanic and Atmospheric Administration, November 1974, 106 p.

²² Comptroller General of the United States, *Federal Agencies Administering Programs Related to Marine Science Activities and Ocean Affairs*, Report to the Congress, U.S. General Accounting Office, GGD-75-61, February 25, 1975, 190 p.

²³ Comptroller General of the United States, *The need for a National Ocean Program and Plan*, Report to the Congress, U.S. General Accounting Office, GGD-75-97, October 10, 1975, 82 p.

²⁴ Federal Council for Science and Technology, Interagency Committee on Marine Science and Engineering, *Federal Water-Related Research, Development, and Management Programs in the Great Lakes Region*. Washington, October 1975, 195 p.

1. Establishment and promulgation of a national policy of marine data management for Federal agencies.²⁵
2. Publication of a catalog on U.S. marine research activities in 1973,²⁶ which updated a previous catalog of fiscal year 1968 research.²⁷
3. Examination of current and planned Federal programs in marine pollution monitoring and surveillance systems.
4. An assessment of the adequacy of program coordination in the Great Lakes.
5. An investigation of the status of marine technician training to detect the existence of a deficiency or oversupply of technicians.²⁸
6. Investigations of needs for coordination among Federal agencies on calibration and standardization of marine instruments, national data buoy programs, and underwater salvage and recovery operations.
7. Preparation of reports on university curricula in the marine sciences and related fields.²⁹
8. Preparation of reports on institutions concerned with water and related resources in the Great Lakes Basin and in the Chesapeake Bay Basin.^{30 31}
9. Assistance to the Interdepartmental Committee for Atmospheric Sciences (ICAS) in review of the National Climate Study Plan.
10. Review of marine social science activities.
11. Development of a policy for a consolidated plan for Federal research clearances and reports by Federal and Federally-sponsored academic research vessels.

²⁵ The ICMSE distributed to Federal agencies an informal document, entitled A Statement of Interagency Policy for Marine Data and Information Management, dated May 11, 1972.

²⁶ Federal Council for Science and Technology. Interagency Committee on Marine Science and Engineering. Marine Research, 1973; A Catalog of Unclassified Marine Research Activities Sponsored by Federal and Non-Federal Organizations. Washington, U.S. Government Printing Office, October 1973. 1175 p.

²⁷ Executive Office of the President. National Council on Marine Resources and Engineering Development. Marine Research, Fiscal Year 1968; A Catalog of Unclassified Marine Research Activities Sponsored During Fiscal Year 1968 by Federal and Non-Federal Organizations. Washington, U.S. Government Printing Office, July 1969. 739 p.

²⁸ Undertaken for ICMSE by the Office of Sea Grant, the study indicated no serious problem; however, ICMSE requested that Sea Grant continue to monitor the technician training situation and to report to ICMSE if problems occur.

²⁹ Federal Council for Science and Technology. Interagency Committee on Marine Science and Engineering. University Curricula in the Marine Sciences and Related Fields, Academic Years 1975-76, 1976-77. Prepared for ICMSE by the Office of Sea Grant by contract to Kaufman DeDell Printing, Inc., Syracuse, N.Y. (no publication date). 226 p.; and Federal Council for Science and Technology. Interagency Committee on Marine Science and Engineering. University Curricula in the Marine Sciences and Related Fields, Academic Years 1973-74, 1974-75 Revised. Prepared for ICMSE by the Office of Sea Grant by contract to Jacobson/Wallace, Inc., New York (no publication date). 176 p.

Prior to publication of these two most recent reports, similar reports on university curricula in the marine sciences were prepared under the auspices of the Interdepartmental Committee on Oceanography and the National Council on Marine Science and Engineering Development.

³⁰ Federal Council for Science and Technology. Interagency Committee on Marine Science and Technology. Great Lakes Directory of Universities, Research Institutes, Libraries, and Agencies Concerned With Water and Land Resources in the Great Lakes Basin, 1976. Prepared for ICMSE by the Great Lakes Environmental Laboratory of NOAA under contract with the Great Lakes Basin Commission, Ann Arbor, Michigan, March 1976. 66 p. (Authors include Ellen M. Prosser, Gretchen R. Sorensen, M. Annette Ketner, Martha W. Deline, and Sandra Baseman.)

³¹ A directory of institutions in the Chesapeake Bay area, similar to the one for the Great Lakes Basin, prepared for the ICMSE by the Army Corps of Engineers, is in final preparation.

ICMSE REPORTS

PUBLISHED REPORTS

The following list contains the reports which have been published under the cognizance of the ICMSE and those to which the ICMSE contributed significantly in preparation :

Executive Office of the President. Office of Science and Technology.

The Federal Ocean Program; the Annual Report of the President to the Congress on the Nation's Efforts to Comprehend, Conserve, and Use the Sea. Washington, U.S. Government Printing Office, April 1972. 121 p.

——— The Federal Ocean Program; the Annual Report of the President to the Congress on the Nation's Efforts to Comprehend, Conserve, and Use the Sea. Washington, U.S. Government Printing Office, April 1973. 133 p.

National Science Foundation. Science and Technology Policy Office.

The Federal Ocean Program; the Annual Report of the President to the Congress on the Nation's Efforts to Comprehend, Conserve, and Use the Sea. Washington, U.S. Government Printing Office, April 1974. 151 p.

Federal Council for Science and Technology. Interagency Committee on Marine Science and Engineering. Proceedings of the First Federal Conference on the Great Lakes (December 13, 14, 15, 1972). Prepared for ICMSE by The Environmental Protection Agency under agreement with the Great Lakes Basin Commission (no publication date). 334 p.

——— Marine Research, 1973; A Catalog of Unclassified Marine Research Activities Sponsored by Federal and Non-Federal Organizations. Washington, U.S. Government Printing Office, October 1973. 1,175 p.

——— Manned Undersea Activities of the Federal Agencies and Utilization of Manned Undersea Research Submersibles and Habitats, December 1972. Washington, U.S. Government Printing Office, April 1974. 51 p.

——— Ocean Instrumentation. Prepared for ICMSE in response to a request from the U.S. Senate National Ocean Policy Study by the National Oceanic and Atmospheric Administration. November 1974. 106 p.

U.S. Congress. Senate. Committee on Commerce. National Ocean Policy Study. Ocean Data Resources. (Committee Print) Washington, U.S. Government Printing Office, March 1975. 60 p.

Hale, Robert F. (study director). The Capital Structure for Ocean Science: Final Report of the Ocean Science and Technology Resources Study (ORS). (by Robert F. Hale, Anne S. Jondrow, James E. Koehr, Susan E. Bender, and Richard A. Kuzmack) Arlington, Va., Center for Naval Analyses, March 1975. CNS 1048. 77 p.

Federal Council for Science and Technology. Interagency Committee on Marine Science and Engineering. The Capital Structure for Ocean Science, 1975. April 17, 1975. 89 p. (The Center for Naval Analyses report on the same subject is included as Appendix B of this report.)

——— Federal Water-Related Research, Development, and Management Programs in the Great Lakes Region. Prepared by ICMSE in response to request from the U.S. Senate National Ocean Policy Study. Washington, October 1975. 195 p.

——— Mapping, Charting, and Geodesy: New Products. 1974. Washington, November 1975. 29 p.

——— Great Lakes Directory of Universities, Research Institutes, Libraries, and Agencies Concerned with Water and Land Resources in the Great Lakes Basin. 1976. (by Ellen M. Prosser, Gretchen R. Sorensen, M. Annette Ketner, Martha W. Deline, and Sandra Baseman) Prepared for ICMSE by the Great Lakes Environmental Laboratory of the National Oceanic and Atmospheric Administration under contract with the Great Lakes Basin Commission, Ann Arbor, Michigan, March 1976. 66 p.

——— University Curricula in the Marine Sciences and Related Fields: Academic Years 1973-74, 1974-75 Revised. Prepared for ICMSE by the Office of Sea Grant under contract to Jacobson/Wallace, Inc. New York (no publication date). 176 p.

——— University Curricula in the Marine Sciences and Related Fields: Academic Years 1975-76, 1976-77. Prepared for ICMSE by the Office of Sea Grant under contract to Kaufman DeDell Printing, Inc., Syracuse, N.Y. (no publication date). 226 p.

REPORTS IN PREPARATION

The following reports, sponsored by the ICMSE or to which the ICMSE has contributed significantly, are in some stage of preparation:

The Federal Ocean Program, 1975.

The Federal Ocean Program, 1976.

Manned Undersea Activities of the Federal Agencies and Utilization of Manned Undersea Research Submersibles and Habitats, April 1975.

Proceedings of the Second Federal Conference on the Great Lakes. Survey of Institutions Concerned with the Water and Related Resources in the Chesapeake Bay Basin,

Opportunities in Oceanography.

APPENDIX O

TEXT OF THE NATIONAL SCIENCE AND TECHNOLOGY POLICY, ORGANIZATION, AND PRIORITIES ACT OF 1976

(PUBLIC LAW 94-282, MAY 11, 1976)

APPENDIX O



Public Law 94-282
94th Congress, H. R. 10230
May 11, 1976

An Act

To establish a science and technology policy for the United States, to provide for scientific and technological advice and assistance to the President, to provide a comprehensive survey of ways and means for improving the Federal effort in scientific research and information handling, and in the use thereof, to amend the National Science Foundation Act of 1950, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "National Science and Technology Policy, Organization, and Priorities Act of 1976".

National Science
and Technology
Policy, Organiza-
tion, and Priori-
ties Act of 1976.
42 USC 6601
note.

TITLE I—NATIONAL SCIENCE, ENGINEERING, AND TECHNOLOGY POLICY AND PRIORITIES

FINDINGS

SEC. 101. (a) The Congress, recognizing the profound impact of science and technology on society, and the interrelations of scientific, technological, economic, social, political, and institutional factors, hereby finds and declares that—

42 USC 6601.

(1) the general welfare, the security, the economic health and stability of the Nation, the conservation and efficient utilization of its natural and human resources, and the effective functioning of government and society require vigorous, perceptive support and employment of science and technology in achieving national objectives;

(2) the many large and complex scientific and technological factors which increasingly influence the course of national and international events require appropriate provision, involving long-range, inclusive planning as well as more immediate program development, to incorporate scientific and technological knowledge in the national decisionmaking process;

(3) the scientific and technological capabilities of the United States, when properly fostered, applied, and directed, can effectively assist in improving the quality of life, in anticipating and resolving critical and emerging international, national, and local problems, in strengthening the Nation's international economic position, and in furthering its foreign policy objectives;

(4) Federal funding for science and technology represents an investment in the future which is indispensable to sustained national progress and human betterment, and there should be a continuing national investment in science, engineering, and technology which is commensurate with national needs and opportunities and the prevalent economic situation;

(5) the manpower pool of scientists, engineers, and technicians, constitutes an invaluable national resource which should be utilized to the fullest extent possible; and

(6) the Nation's capabilities for technology assessment and for technological planning and policy formulation must be strengthened at both Federal and State levels.

Priority goals.

(b) As a consequence, the Congress finds and declares that science and technology should contribute to the following priority goals without being limited thereto:

(1) fostering leadership in the quest for international peace and progress toward human freedom, dignity, and well-being by enlarging the contributions of American scientists and engineers to the knowledge of man and his universe, by making discoveries of basic science widely available at home and abroad, and by utilizing technology in support of United States national and foreign policy goals;

(2) increasing the efficient use of essential materials and products, and generally contributing to economic opportunity, stability, and appropriate growth;

(3) assuring an adequate supply of food, materials, and energy for the Nation's needs;

(4) contributing to the national security;

(5) improving the quality of health care available to all residents of the United States;

(6) preserving, fostering, and restoring a healthful and esthetic natural environment;

(7) providing for the protection of the oceans and coastal zones, and the polar regions, and the efficient utilization of their resources;

(8) strengthening the economy and promoting full employment through useful scientific and technological innovations;

(9) increasing the quality of educational opportunities available to all residents of the United States;

(10) promoting the conservation and efficient utilization of the Nation's natural and human resources;

(11) improving the Nation's housing, transportation, and communication systems, and assuring the provision of effective public services throughout urban, suburban, and rural areas;

(12) eliminating air and water pollution, and unnecessary, unhealthful, or ineffective drugs and food additives; and

(13) advancing the exploration and peaceful uses of outer space.

DECLARATION OF POLICY

42 USC 6602.

SEC. 102. (a) PRINCIPLES.—In view of the foregoing, the Congress declares that the United States shall adhere to a national policy for science and technology which includes the following principles:

(1) The continuing development and implementation of strategies for determining and achieving the appropriate scope, level, direction, and extent of scientific and technological efforts based upon a continuous appraisal of the role of science and technology in achieving goals and formulating policies of the United States, and reflecting the views of State and local governments and representative public groups.

(2) The enlistment of science and technology to foster a healthy economy in which the directions of growth and innovation are compatible with the prudent and frugal use of resources and with the preservation of a benign environment.

(3) The conduct of science and technology operations so as to serve domestic needs while promoting foreign policy objectives.

(4) The recruitment, education, training, retraining, and beneficial use of adequate numbers of scientists, engineers, and tech-

May 11, 1976

- 3 -

Pub. Law 94-282

nologists, and the promotion by the Federal Government of the effective and efficient utilization in the national interest of the Nation's human resources in science, engineering, and technology.

(5) The development and maintenance of a solid base for science and technology in the United States, including: (A) strong participation of and cooperative relationships with State and local governments and the private sector; (B) the maintenance and strengthening of diversified scientific and technological capabilities in government, industry, and the universities, and the encouragement of independent initiatives based on such capabilities, together with elimination of needless barriers to scientific and technological innovation; (C) effective management and dissemination of scientific and technological information; (D) establishment of essential scientific, technical and industrial standards and measurement and test methods; and (E) promotion of increased public understanding of science and technology.

(6) The recognition that, as changing circumstances require periodic revision and adaptation of title I of this Act, the Federal Government is responsible for identifying and interpreting the changes in those circumstances as they occur, and for effecting subsequent changes in title I as appropriate.

(b) IMPLEMENTATION.—To implement the policy enunciated in subsection (a) of this section, the Congress declares that:

(1) The Federal Government should maintain central policy planning elements in the executive branch which assist Federal agencies in (A) identifying public problems and objectives, (B) mobilizing scientific and technological resources for essential national programs, (C) securing appropriate funding for programs so identified, (D) anticipating future concerns to which science and technology can contribute and devising strategies for the conduct of science and technology for such purposes, (E) reviewing systematically Federal science policy and programs and recommending legislative amendment thereof when needed. Such elements should include an advisory mechanism within the Executive Office of the President so that the Chief Executive may have available independent, expert judgment and assistance on policy matters which require accurate assessments of the complex scientific and technological features involved.

(2) It is a responsibility of the Federal Government to promote prompt, effective, reliable, and systematic transfer of scientific and technological information by such appropriate methods as programs conducted by nongovernmental organizations, including industrial groups and technical societies. In particular, it is recognized as a responsibility of the Federal Government not only to coordinate and unify its own science and technology information systems, but to facilitate the close coupling of institutional scientific research with commercial application of the useful findings of science.

(3) It is further an appropriate Federal function to support scientific and technological efforts which are expected to provide results beneficial to the public but which the private sector may be unwilling or unable to support.

(4) Scientific and technological activities which may be properly supported exclusively by the Federal Government should be distinguished from those in which interests are shared with State and local governments and the private sector. Among these enti-

ties, cooperative relationships should be established which encourage the appropriate sharing of science and technology decisionmaking, funding support, and program planning and execution.

(5) The Federal Government should support and utilize engineering and its various disciplines and make maximum use of the engineering community, whenever appropriate, as an essential element in the Federal policymaking process.

(6) Comprehensive legislative support for the national science and technology effort requires that the Congress be regularly informed of the condition, health and vitality, and funding requirements of science and technology, the relation of science and technology to changing national goals, and the need for legislative modification of the Federal endeavor and structure at all levels as it relates to science and technology.

(c) **PROCEDURES.**—The Congress declares that, in order to expedite and facilitate the implementation of the policy enunciated in subsection (a) of this section, the following coordinate procedures are of paramount importance:

(1) Federal procurement policy should encourage the use of science and technology to foster frugal use of materials, energy, and appropriated funds; to assure quality environment; and to enhance product performance.

(2) Explicit criteria, including cost-benefit principles where practicable, should be developed to identify the kinds of applied research and technology programs that are appropriate for Federal funding support and to determine the extent of such support. Particular attention should be given to scientific and technological problems and opportunities offering promise of social advantage that are so long range, geographically widespread, or economically diffused that the Federal Government constitutes the appropriate source for undertaking their support.

(3) Federal promotion of science and technology should emphasize quality of research, recognize the singular importance of stability in scientific and technological institutions, and for urgent tasks, seek to assure timeliness of results. With particular reference to Federal support for basic research, funds should be allocated to encourage education in needed disciplines, to provide a base of scientific knowledge from which future essential technological development can be launched, and to add to the cultural heritage of the Nation.

(4) Federal patent policies should be developed, based on uniform principles, which have as their objective the preservation of incentives for technological innovation and the application of procedures which will continue to assure the full use of beneficial technology to serve the public.

(5) Closer relationships should be encouraged among practitioners of different scientific and technological disciplines, including the physical, social, and biomedical fields.

(6) Federal departments, agencies, and instrumentalities should assure efficient management of laboratory facilities and equipment in their custody, including acquisition of effective equipment, disposal of inferior and obsolete properties, and cross-servicing to maximize the productivity of costly property of all kinds. Disposal policies should include attention to possibilities for further productive use.

May 11, 1976

- 5 -

Pub. Law 94-282

(7) The full use of the contributions of science and technology to support State and local government goals should be encouraged.

(8) Formal recognition should be accorded those persons whose scientific and technological achievements have contributed significantly to the national welfare.

(9) The Federal Government should support applied scientific research, when appropriate, in proportion to the probability of its usefulness, insofar as this probability can be determined; but while maximizing the beneficial consequences of technology, the Government should act to minimize foreseeable injurious consequences.

(10) Federal departments, agencies, and instrumentalities should establish procedures to insure among them the systematic interchange of scientific data and technological findings developed under their programs.

TITLE II—OFFICE OF SCIENCE AND TECHNOLOGY POLICY

SHORT TITLE

Presidential
Science and
Technology Ad-
visory Organi-
zation Act of 1976.

SEC. 201. This title may be cited as the "Presidential Science and Technology Advisory Organization Act of 1976".

42 USC 6611
note.

ESTABLISHMENT

SEC. 202. There is established in the Executive Office of the President an Office of Science and Technology Policy (hereinafter referred to in this title as the "Office").

42 USC 6611.

DIRECTOR; ASSOCIATE DIRECTORS

SEC. 203. There shall be at the head of the Office a Director who shall be appointed by the President, by and with the advice and consent of the Senate, and who shall be compensated at the rate provided for level II of the Executive Schedule in section 5313 of title 5, United States Code. The President is authorized to appoint not more than four Associate Directors, by and with the advice and consent of the Senate, who shall be compensated at a rate not to exceed that provided for level III of the Executive Schedule in section 5314 of such title. Associate Directors shall perform such functions as the Director may prescribe.

Appointment.
Compensation.
42 USC 6612.

FUNCTIONS

SEC. 204. (a) The primary function of the Director is to provide, within the Executive Office of the President, advice on the scientific, engineering, and technological aspects of issues that require attention at the highest levels of Government.

42 USC 6613.

(b) In addition to such other functions and activities as the President may assign, the Director shall—

(1) advise the President of scientific and technological considerations involved in areas of national concern including, but not limited to, the economy, national security, health, foreign relations, the environment, and the technological recovery and use of resources;

(2) evaluate the scale, quality, and effectiveness of the Federal effort in science and technology and advise on appropriate actions;

(3) advise the President on scientific and technological considerations with regard to Federal budgets, assist the Office of Management and Budget with an annual review and analysis of funding proposed for research and development in budgets of all Federal agencies, and aid the Office of Management and Budget and the agencies throughout the budget development process; and

(4) assist the President in providing general leadership and coordination of the research and development programs of the Federal Government.

POLICY PLANNING, ANALYSIS, AND ADVICE

42 USC 6614.

SEC. 205. (a) The Office shall serve as a source of scientific and technological analysis and judgment for the President with respect to major policies, plans, and programs of the Federal Government. In carrying out the provisions of this section, the Director shall—

(1) seek to define coherent approaches for applying science and technology to critical and emerging national and international problems and for promoting coordination of the scientific and technological responsibilities and programs of the Federal departments and agencies in the resolution of such problems;

Science and
Technology
Report.

(2) assist and advise the President in the preparation of the Science and Technology Report, in accordance with section 209 of this Act;

(3) gather timely and authoritative information concerning significant developments and trends in science, technology, and in national priorities, both current and prospective, to analyze and interpret such information for the purpose of determining whether such developments and trends are likely to affect achievement of the priority goals of the Nation as set forth in section 101(b) of this Act;

Data base.

(4) encourage the development and maintenance of an adequate data base for human resources in science, engineering, and technology, including the development of appropriate models to forecast future manpower requirements, and assess the impact of major governmental and public programs on human resources and their utilization;

Studies and
analyses.

(5) initiate studies and analyses, including systems analyses and technology assessments, of alternatives available for the resolution of critical and emerging national and international problems amenable to the contributions of science and technology and, insofar as possible, determine and compare probable costs, benefits, and impacts of such alternatives;

(6) advise the President on the extent to which the various scientific and technological programs, policies, and activities of the Federal Government are likely to affect the achievement of the priority goals of the Nation as set forth in section 101(b) of this Act;

(7) provide the President with periodic reviews of Federal statutes and administrative regulations of the various departments and agencies which affect research and development activities, both internally and in relation to the private sector, or which may interfere with desirable technological innovation, together with

May 11, 1976

- 7 -

Pub. Law 94-282

recommendations for their elimination, reform, or updating as appropriate;

(8) develop, review, revise, and recommend criteria for determining scientific and technological activities warranting Federal support, and recommend Federal policies designed to advance (A) the development and maintenance of broadly based scientific and technological capabilities, including human resources, at all levels of government, academia, and industry, and (B) the effective application of such capabilities to national needs;

(9) assess and advise on policies for international cooperation in science and technology which will advance the national and international objectives of the United States;

(10) identify and assess emerging and future areas in which science and technology can be used effectively in addressing national and international problems;

(11) report at least once each year to the President on the overall activities and accomplishments of the Office, pursuant to section 209 of this Act;

Report to
President.

(12) periodically survey the nature and needs of national science and technology policy and make recommendations to the President, for review and transmission to the Congress, for the timely and appropriate revision of such policy in accordance with section 102(a)(6) of this Act; and

(13) perform such other duties and functions and make and furnish such studies and reports thereon, and recommendations with respect to matters of policy and legislation as the President may request.

(b)(1) The Director shall establish an Intergovernmental Science, Engineering, and Technology Advisory Panel (hereinafter referred to as the "Panel"), whose purpose shall be to (A) identify and define civilian problems at State, regional, and local levels which science, engineering, and technology may assist in resolving or ameliorating; (B) recommend priorities for addressing such problems; and (C) advise and assist the Director in identifying and fostering policies to facilitate the transfer and utilization of research and development results so as to maximize their application to civilian needs.

Intergovern-
mental Science,
Engineering, and
Technology Ad-
visory Panel.
Establishment.

(2) The Panel shall be composed of (A) the Director of the Office, or his representative; (B) at least ten members representing the interests of the States, appointed by the Director of the Office after consultation with State officials; and (C) the Director of the National Science Foundation, or his representative.

Membership.

(3)(A) The Director of the Office, or his representative, shall serve as Chairman of the Panel.

Chairman.

(B) The Panel shall perform such functions as the Chairman may prescribe, and shall meet at the call of the Chairman.

(4) Each member of the Panel shall, while serving on business of the Panel, be entitled to receive compensation at a rate not to exceed the daily rate prescribed for GS-18 of the General Schedule under section 5332 of title 5, United States Code, including traveltime, and, while so serving away from his home or regular place of business, he may be allowed travel expenses, including per diem in lieu of subsistence in the same manner as the expenses authorized by section 5703 (b) of title 5, United States Code, for persons in government service employed intermittently.

Compensation.

5 USC 5332
note.

FIVE-YEAR OUTLOOK

42 USC 6615.

SEC. 206. (a) Within its first year of operation, the Office shall, to the extent practicable, within the limitations of available knowledge and resources, and with appropriate assistance from the departments and agencies and such consultants and contractors as the Director deems necessary, identify and describe situations and conditions which warrant special attention within the next five years, involving—

(1) current and emerging problems of national significance that are identified through scientific research, or in which scientific or technical considerations are of major significance; and

(2) opportunities for, and constraints on, the use of new and existing scientific and technological capabilities which can make a significant contribution to the resolution of problems identified under paragraph (1) of this subsection or to the achievement of Federal program objectives or national goals, including those set forth in section 101(b) of this Act.

Annual revision.

(b) The Office shall annually revise the five-year outlook developed under subsection (a) of this section so that it takes account of new problems, constraints and opportunities and changing national goals and circumstances, and shall extend the outlook so that it always extends five years into the future.

Consultation.

(c) The Director of the Office shall consult as necessary with officials of the departments and agencies having programs and responsibilities relating to the problems, constraints, and opportunities identified under subsections (a) and (b) of this section, in order to—

(1) identify and evaluate alternative actions that might be taken by the Federal Government, State and local governments, or the private sector to deal with such problems, constraints, or opportunities; and

(2) ensure that alternative actions identified under paragraph (1) of this subsection are fully considered by departments and agencies in formulating their budget, program, and legislative proposals.

Consultation.

(d) The Director of the Office shall consult as necessary with officials of the Office of Management and Budget and other appropriate elements of the Executive Office of the President to ensure that the problems, constraints, opportunities, and alternative actions identified under subsections (a), (b), and (c) of this section are fully considered in the development of the President's Budgets and legislative programs.

ADDITIONAL FUNCTIONS OF THE DIRECTOR;
ADMINISTRATIVE PROVISIONS

42 USC 6616.

SEC. 207. (a) The Director shall, in addition to the other duties and functions set forth in this title—

(1) serve as Chairman of the Federal Coordinating Council for Science, Engineering, and Technology established under title IV; and

(2) serve as a member of the Domestic Council.

(b) For the purpose of assuring the optimum contribution of science and technology to the national security, the Director, at the request of the National Security Council, shall advise the National Security Council in such matters concerning science and technology as relate to national security.

May 11, 1976

- 9 -

Pub. Law 94-282

(c) In carrying out his functions under this Act, the Director is authorized to—

(1) appoint such officers and employees as he may deem necessary to perform the functions now or hereafter vested in him and to prescribe their duties;

(2) obtain services as authorized by section 3109 of title 5 of the United States Code, at rates not to exceed the rate prescribed for grade GS-18 of the General Schedule by section 5332 of title 5 of the United States Code; and

5 USC 5332
note.

(3) enter into contracts and other arrangements for studies, analyses, and other services with public agencies and with private persons, organizations, or institutions, and make such payments as he deems necessary to carry out the provisions of this Act without legal consideration, without performance bonds, and without regard to section 3709 of the Revised Statutes (41 U.S.C. 5).

COORDINATION WITH OTHER ORGANIZATIONS

SEC. 208. (a) In exercising his functions under this Act, the Director shall— 42 USC 6617.

(1) work in close consultation and cooperation with the Domestic Council, the National Security Council, the Council on Environmental Quality, the Council of Economic Advisers, the Office of Management and Budget, the National Science Board, and the Federal departments and agencies;

(2) utilize the services of consultants, establish such advisory panels, and, to the extent practicable, consult with State and local governmental agencies, with appropriate professional groups, and with such representatives of industry, the universities, agriculture, labor, consumers, conservation organizations, and such other public interest groups, organizations, and individuals as he deems advisable;

(3) hold such hearings in various parts of the Nation as he deems necessary, to determine the views of the agencies, groups, and organizations referred to in paragraph (2) of this subsection and of the general public, concerning national needs and trends in science and technology; and

Hearings.

(4) utilize with their consent to the fullest extent possible the services, personnel, equipment, facilities, and information (including statistical information) of public and private agencies and organizations, and individuals, in order to avoid duplication of effort and expense, and may transfer funds made available pursuant to this Act to other Federal agencies as reimbursement for the utilization of such personnel, services, facilities, equipment, and information.

(b) Each department, agency, and instrumentality of the Executive Branch of the Government, including any independent agency, is authorized to furnish the Director such information as the Director deems necessary to carry out his functions under this Act.

(c) Upon request, the Administrator of the National Aeronautics and Space Administration is authorized to assist the Director with respect to carrying out his activities conducted under paragraph (5) of section 205(a) of this Act.

SCIENCE AND TECHNOLOGY REPORT

Transmittal to
Congress.
42 USC 6618.

SEC. 209. (a) The President shall transmit annually to the Congress, beginning February 15, 1978, a Science and Technology Report (hereinafter referred to as the "Report") which shall be prepared by the Office, with appropriate assistance from Federal departments and agencies and such consultants and contractors as the Director deems necessary. The report shall draw upon the information prepared by the Director pursuant to section 206 of this Act, and to the extent practicable, within the limitations of available knowledge and resources, discuss such issues as—

(1) a review of developments of national significance in science and technology;

(2) the significant effects of current and projected trends in science and technology on the social, economic, and other requirements of the Nation;

(3) a review and appraisal of selected science- and technology-related programs, policies, and activities of the Federal Government;

(4) an inventory and forecast of critical and emerging national problems the resolution of which might be substantially assisted by the application of science and technology;

(5) the identification and assessment of scientific and technological measures that can contribute to the resolution of such problems, in light of the related social, economic, political, and institutional considerations;

(6) the existing and projected scientific and technological resources, including specialized manpower, that could contribute to the resolution of such problems; and

(7) recommendations for legislation on science- and technology-related programs and policies that will contribute to the resolution of such problems.

(b) In preparing the Report under subsection (a) of this section, the Office shall make maximum use of relevant data available from the National Science Foundation and other Government departments and agencies.

(c) The Director shall insure that the Report, in the form approved by the President, is printed and made available as a public document.

Public document.

TITLE III—PRESIDENT'S COMMITTEE ON SCIENCE AND TECHNOLOGY

ESTABLISHMENT

42 USC 6631.

SEC. 301. The President shall establish within the Executive Office of the President a President's Committee on Science and Technology (hereinafter referred to as the "Committee").

MEMBERSHIP

42 USC 6632.

SEC. 302. (a) The Committee shall consist of—

(1) the Director of the Office of Science and Technology Policy established under title II of this Act; and

(2) not less than eight nor more than fourteen other members appointed by the President not more than sixty days after the Director has assumed office (as provided in section 203 of this Act).

May 11, 1976

- 11 -

Pub. Law 94-282

(b) Members of the Committee appointed by the President pursuant to subsection (a) (2) of this section shall—

(1) be qualified and distinguished in one or more of the following areas: science, engineering, technology, information dissemination, education, management, labor, or public affairs;

(2) be capable of critically assessing the policies, priorities, programs, and activities of the Nation, with respect to the findings, policies, and purposes set forth in title I; and

(3) shall collectively constitute a balanced composition with respect to (A) fields of science and engineering, (B) academic, industrial, and government experience, and (C) business, labor, consumer, and public interest points of view.

(c) The President shall appoint one member of the Committee to serve as Chairman and another member to serve as Vice Chairman for such periods as the President may determine.

(d) Each member of the Committee who is not an officer of the Federal Government shall, while serving on business of the Committee, be entitled to receive compensation at a rate not to exceed the daily rate prescribed for GS-18 of the General Schedule under section 5332 of title 5, United States Code, including traveltime, and while so serving away from his home or regular place of business he may be allowed travel expenses, including per diem in lieu of subsistence, in the same manner as the expenses authorized by section 5703(b) of title 5, United States Code, for persons in Government service employed intermittently.

Chairman.

Compensation.

5 USC 5332
note.

FEDERAL SCIENCE, ENGINEERING, AND TECHNOLOGY SURVEY

SEC. 303. (a) The Committee shall survey, examine, and analyze the overall context of the Federal science, engineering, and technology effort including missions, goals, personnel, funding, organization, facilities, and activities in general, taking adequate account of the interests of individuals and groups that may be affected by Federal scientific, engineering, and technical programs, including, as appropriate, consultation with such individuals and groups. In carrying out its functions under this section, the Committee shall, among other things, consider needs for—

42 USC 6633.

(1) organizational reform, including institutional realignment designed to place Federal agencies whose missions are primarily or solely devoted to scientific and technological research and development, and those agencies primarily or solely concerned with fuels, energy, and materials, within a single cabinet-level department;

(2) improvements in existing systems for handling scientific and technical information on a Government-wide basis, including consideration of the appropriate role to be played by the private sector in the dissemination of such information;

(3) improved technology assessment in the executive branch of the Federal Government;

(4) improved methods for effecting technology innovation, transfer, and use;

(5) stimulating more effective Federal-State and Federal-industry liaison and cooperation in science and technology, including the formation of Federal-State mechanisms for the mutual pursuit of this goal;

(6) reduction and simplification of Federal regulations and administrative practices and procedures which may have the effect of retarding technological innovation or opportunities for its utilization;

(7) a broader base for support of basic research;

(8) ways of strengthening the Nation's academic institutions' capabilities for research and education in science and technology;

(9) ways and means of effectively integrating scientific and technological factors into our national and international policies;

(10) technology designed to meet community and individual needs;

(11) maintenance of adequate scientific and technological manpower with regard to both quality and quantity;

(12) improved systems for planning and analysis of the Federal science and technology programs; and

(13) long-range study, analysis, and planning in regard to the application of science and technology to major national problems or concerns.

Interim report.

(b) (1) Within twelve months from the time the Committee is activated in accordance with section 302(a) of this Act, the Committee shall issue an interim report of its activities and operations to date. Not more than twenty-four months from the time the Committee is activated, the Committee shall submit a final report of its activities, findings, conclusions, and recommendations, including such supporting data and material as may be necessary, to the President.

Report to President.

Transmittal to Congress.

(2) The President, within sixty days of receipt thereof, shall transmit each such report to each House of Congress together with such comments, observations, and recommendations thereon as he deems appropriate.

CONTINUATION OF COMMITTEE

42 USC 6634.

SEC. 304. (a) Ninety days after submission of the final report prepared under section 303 of this Act, the Committee shall cease to exist, unless the President, before the expiration of the ninety-day period, makes a determination that it is advantageous for the Committee to continue in being.

(b) If the President determines that it is advantageous for the Committee to continue in being, (1) the Committee shall exercise such functions as are prescribed by the President; and (2) the members of the Committee shall serve at the pleasure of the President.

STAFF AND CONSULTANT SUPPORT

42 USC 6635.

SEC. 305. (a) In the performance of its functions under sections 303 and 304 of this Act, the Committee is authorized—

(1) to select, appoint, employ, and fix the compensation of such specialists and other experts as may be necessary for the carrying out of its duties and functions, and to select, appoint, and employ, subject to the civil service laws, such other officers and employees as may be necessary for carrying out its duties and functions; and

(2) to provide for participation of such civilian and military personnel as may be detailed to the Committee pursuant to subsection (b) of this section for carrying out the functions of the Committee.

(b) Upon request of the Committee, the head of any Federal department, agency, or instrumentality is authorized (1) to furnish to

May 11, 1976

- 13 -

Pub. Law 94-282

the Committee such information as may be necessary for carrying out its functions and as may be available to or procurable by such department, agency, or instrumentality, and (2) to detail to temporary duty with the Committee on a reimbursable basis such personnel within his administrative jurisdiction as it may need or believe to be useful for carrying out its functions. Each such detail shall be without loss of seniority, pay, or other employee status, to civilian employees so detailed, and without loss of status, rank, office, or grade, or of any emolument, perquisite, right, privilege, or benefit incident thereto to military personnel so detailed. Each such detail shall be made pursuant to an agreement between the Chairman and the head of the relevant department, agency, or instrumentality, and shall be in accordance with the provisions of subchapter III of chapter 33, title 5, United States Code.

5 USC 3341.

TITLE IV—FEDERAL COORDINATING COUNCIL FOR SCIENCE, ENGINEERING, AND TECHNOLOGY

ESTABLISHMENT AND FUNCTIONS

SEC. 401. (a) There is established the Federal Coordinating Council for Science, Engineering, and Technology (hereinafter referred to as the "Council").

42 USC 6651.

(b) The Council shall be composed of the Director of the Office of Science and Technology Policy and one representative of each of the following Federal agencies: Department of Agriculture, Department of Commerce, Department of Defense, Department of Health, Education, and Welfare, Department of Housing and Urban Development, Department of the Interior, Department of State, Department of Transportation, Veterans' Administration, National Aeronautics and Space Administration, National Science Foundation, Environmental Protection Agency, and Energy Research and Development Administration. Each such representative shall be an official of policy rank designated by the head of the Federal agency concerned.

Membership.

(c) The Director of the Office of Science and Technology Policy shall serve as Chairman of the Council. The Chairman may designate another member of the Council to act temporarily in the Chairman's absence as Chairman.

Chairman.

(d) The Chairman may (1) request the head of any Federal agency not named in subsection (b) of this section to designate a representative to participate in meetings or parts of meetings of the Council concerned with matters of substantial interest to such agency, and (2) invite other persons to attend meetings of the Council.

(e) The Council shall consider problems and developments in the fields of science, engineering, and technology and related activities affecting more than one Federal agency, and shall recommend policies and other measures designed to—

(1) provide more effective planning and administration of Federal scientific, engineering, and technological programs,

(2) identify research needs including areas requiring additional emphasis,

(3) achieve more effective utilization of the scientific, engineering, and technological resources and facilities of Federal agencies, including the elimination of unwarranted duplication, and

(4) further international cooperation in science, engineering, and technology.

(f) The Council shall perform such other related advisory duties as shall be assigned by the President or by the Chairman.

(g) For the purpose of carrying out the provisions of this section, each Federal agency represented on the Council shall furnish necessary assistance to the Council. Such assistance may include—

(1) detailing employees to the Council to perform such functions, consistent with the purposes of this section, as the Chairman may assign to them, and

(2) undertaking, upon request of the Chairman, such special studies for the Council as come within the functions herein assigned.

Subcommittees
and panels,
establishment.

(h) For the purpose of conducting studies and making reports as directed by the Chairman, standing subcommittees and panels of the Council may be established.

ABOLITION OF FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

42 USC 1862
note.

SEC. 402. The Federal Council for Science and Technology, established pursuant to Executive Order 10807, issued March 13, 1959, as amended by Executive Order 11381, issued November 8, 1967, is hereby abolished.

42 USC 1862
note.

TITLE V—GENERAL PROVISIONS

AUTHORIZATION

42 USC 6671.

SEC. 501. (a) For the purpose of carrying out title II of this Act, there are authorized to be appropriated—

(1) \$750,000 for the fiscal year ending June 30, 1976;

(2) \$500,000 for the period beginning July 1, 1976, and ending September 30, 1976;

(3) \$3,000,000 for the fiscal year ending September 30, 1977; and

(4) such sums as may be necessary for each of the succeeding fiscal years.

(b) For the purpose of carrying out title III of this Act, there are authorized to be appropriated—

(1) \$750,000 for the fiscal year ending June 30, 1976;

(2) \$500,000 for the period beginning July 1, 1976, and ending September 30, 1976;

(3) \$1,000,000 for the fiscal year ending September 30, 1977; and

(4) such sums as may be necessary for each of the succeeding fiscal years.

STATUTORY REPEAL

5 USC app.;
42 USC 1861
note.

SEC. 502. Sections 1, 2, 3, and 4 of Reorganization Plan Numbered 2 of 1962 (76 Stat. 1253) and section 2 of Reorganization Plan Numbered 1 of 1973 (87 Stat. 1089) are repealed.

5 USC app. II;
50 USC app. 2271
note.

May 11, 1976

- 15 -

Pub. Law 94-282

AMENDMENT

SEC. 503. Section 4 of the National Science Foundation Act of 1950 (42 U.S.C. 1863) is amended by striking out subsection (g) and by redesignating subsections (h), (i), and (j), and all references thereto, as subsections (g), (h), and (i), respectively.

Approved May 11, 1976.

LEGISLATIVE HISTORY:

HOUSE REPORTS: No. 94-595 (Comm. on Science and Technology) and No. 94-1046 (Comm. of Conference).

SENATE REPORTS: No. 94-622 accompanying S. 32 (Committees on Labor and Public Welfare, Commerce, and Aeronautical and Space Sciences) and No. 94-765 (Comm. of Conference).

CONGRESSIONAL RECORD:

Vol. 121 (1975): Nov. 6, considered and passed House.

Vol. 122 (1976): Feb. 4, considered and passed Senate, amended, in lieu of S. 32.

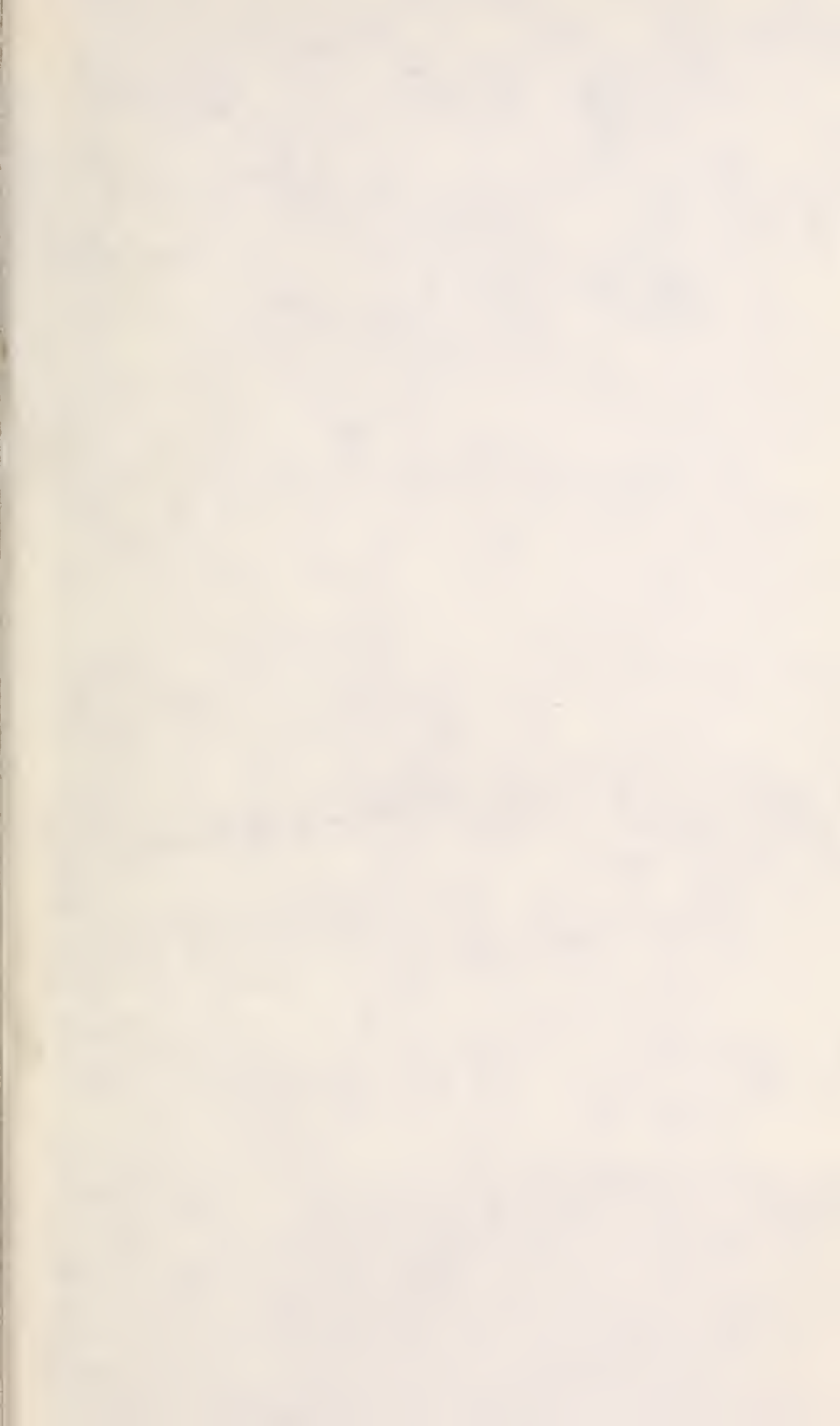
Apr. 27, Senate agreed to conference report.

Apr. 29, House agreed to conference report.

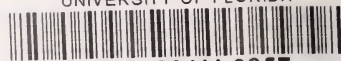
WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS:

Vol. 12, No. 20 (1976): May 11, Presidential statement.





UNIVERSITY OF FLORIDA



3 1262 09114 3957